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Part II: The General Principles of Oeconomy

Chapter 1. Oeconomy: A Branch of Governance

Oeconomy's specifications, as we have just seen, begin with the assertion that it is a branch of governance. This claim will guide the ideas advanced in part two of this book.

As we explained in part one, governance refers to the rules created by a society to ensure its survival, its fulfillment, its longevity, and its adaptability. To use the language of biologists, every living being—and society *is* a living being—must, if it wants to survive, achieve internal cohesion (up to a point), be able to protect itself, and maintain a harmonious relationship with its natural environment. In human societies, these rules must be conscious and the outcome of learning processes. In this way, human societies distinguish themselves, say, from ant colonies.

Oeconomy's goals—ensuring humanity a maximum degree of well-being, enriching the biosphere, and preserving the interests, rights, and capacity to act of future generations, under conditions of responsibility and equity to which all can adhere—are shared by governance of all forms of. Nor does oeconomy stand out in the way that it implements these goals: all forms of governance involve ideologies, concepts, actors, institutional arrangements, processes, and rules. Oeconomy's specificity lies only in its field of action: the production, the distribution, and the use of goods and services.

Governance is an eternal question. Some of humanity's most ancient texts are essentially treatises on governance, laying out the principles of wise government as Deuteronomy does for the Hebrews or Hammurabi's Code for the Babylonians. Writing, accounting, and currency were designed to make transactions safe and contracts lasting. As such, they are acts of governance. From the time of Solon, the Athenian legislator, through Aristotle to the medieval moralists, the problem of wealth and its equitable distribution has been constantly debated.[1] The Enlightenment and early liberal thinkers, such as Locke, Hume, and Smith, were the first to argue that state intervention should be severely limited. They believed that the rising bourgeoisie was better able to organize production in the interest of the common good than were traditional laws, customs, corporations, and bureaucracies. But let us not overlook the essential point: these ideas, even when they assert the primacy of the individual over society, are nonetheless theories of governance.

The *form* of governance has, however, varied over time. Its mechanisms are shaped by ecological, technological, and cultural contexts,[2] as well as by each society's unique history. The evolution of this form is a slow process *par excellence,* as governance relies on a culture's most stable attributes, such as its conception of the relationship between the individual and society and attitudes towards authority. Governance evolves on the basis of previous social achievements. But it must also react to external inputs and new technological opportunities and craft responses to all the novel challenges that society encounters. Like culture and language, it is formed through a process of hybridization. One implication of governance's definition is that each society, at a particular moment in its history, must invent the form of governance to which it is

[1] Matthieu Calame's book *La tourmente alimentaire* includes a well-documented discussion of these debates in the context of ancient rural societies.

[2] For an overview on cultural differences, see Michel Sauquet's *L'intelligence de l'autre*, Éd. Charles Léopold Mayer, 2007.

best suited. Consequently, we tend to praise governance as "appropriate" rather than "good." Even so, this invention occurs by applying a handful of basic principles, which are governance's "constants."

Another factor shaping governance's evolution, and which also pertains to oeconomy, relates to a society's size and its interaction with other societies. The historian Fernand Braudel argued that the economy consists of three levels: the domestic economy, the national market economy, and the world economy. Governance has three levels of its own: local management, management by the state, and world governance.

For classical economics, these three levels correspond to different degree of commercial intensity. As a society's nature, size, interactions with the outside world evolve, the way it is governed and the respective importance of each level must change accordingly.

The crisis in contemporary governance is a result of the sluggishness with which its forms and institutions evolve. We are the heirs, but also the prisoners, of institutions and concepts forged over the centuries. The dominant forms of governance in economically developed countries—the state, representative democracy, and the market economy—have a long history. Our doctrines and institutions were not built over decades or even centuries, but over millennia. Given that governance's task is to ensure a society's survival and stability, it is only natural that the institutions and ideologies it creates are stable. Ideologies tend to create actors and institutions for whom their premises are self-evident. In part one, we encountered many examples of this trend in economic thinking.

Governance's inertia only becomes a problem when society enters a phase of rapid change, opens itself to new opportunities, confronts new challenges, shakes up its priorities, and finds itself involved in new relationships which must be managed on a different scale. We have

been in such a phase for at least a century. In these situations, we tend to turn to yesterday's ideas and even older institutions to conceptualize and prepare for the future. In a rapidly changing society, the forms of governance built over previous centuries cease to be relevant to the task of ensuring society's survival, which, after all, is governance's primary goal.

In such circumstances, history can help us to deconstruct truths that seem self-evident and to rediscover the particular circumstances (be they cultural or technological) in which one course was chosen over another. We must return in short, to the original fork in the road. This was what we did in part one. States were established at a particular historical moment: in the West, after the Renaissance. Their consolidation gave birth to the Westphalian theory—a doctrine formalized by the Treaty of Westphalia of 1648, which ended the devastating Thirty Years War. This doctrine, still prevalent in international law, has thus been around for 350 years. In France, the state bureaucracy was first created by the Capetian kings: it began as a single "royal household," but, over the centuries, new corps of top civil servants were created, increasingly distinct from the aristocracy, and the public treasury split off from the royal treasury. The division of the state bureaucracy into various institutions endowed with specific areas of competence occurred in tandem with the gradual emergence of the modern university, which distanced itself from theology and organized itself into distinct academic faculties, each devoted to a particular branch of knowledge. The Westphalian state and the modern university, first conceived by von Humboldt, are among the major European institutions emerging in the period between the seventeenth and the late eighteenth centuries. This period also witnessed the emeregence of the modern corporation out of the commercial and manufacturing "companies" of the Renaissance. The economic theories of which we are both the heirs and prisoners reflect the state of the world at this time. Our multinational corporations obviously have little in common

with eighteenth-century factories, anymore than our major retail chains resemble the Hanseatic League[3] or modern pension funds are similar to Renaissance bankers. Even so: our economy's primary actors, our primary institutional arrangements, and the conceptual system that undergirds them all reflect society not as it is today, but as it was two hundred years ago.

How governance functions depends heavily on existing technology (and in this respect, too, oeconomy is just a special case of governance). Representative democracy illustrates this point perfectly. At the time of the French Revolution, for example, the constituent assembly debated how to divide the nation's territory up into departments. One criterion was that nowhere in the department could be further than a day's horse ride from the prefecture (i.e., the department seat). Even today, democracy depends on the elections of representatives who will meet in a capital city at a precise time. This practice is a direct legacy of the royal tradition of summoning delegates to approve taxes. Our representative systems still bear the mark of these earlier times. During the Middle Ages, political entities were too large for all free citizens to assemble in one place, as they could in ancient Greece; long-distance communication was difficult; the ability to write—the vehicle for transmitting thoughts and rules—was a specialized skill known to only a fraction of the population; and telephones and teleconferencing were inexistent, so the only way to reach agreements was to call a meeting. Representative democracy grew out of these constraints, and its basic features have changed little over the past two centuries.

It is not surprising that new communication systems would transform not only production and exchange, but other aspects of governance as well. Thanks to the internet, global civil society can attend international negotiations, which were previously reserved only to states and

[3] The Hanseatic League was a confederation of German merchants created in the twelfth century.

international institutions. Through media campaigns, it can also negotiate one-on-one with corporations, challenging their economic practices.

The change in the scale (and thus the nature) of humanity's impact on the biosphere is another major factor in the crisis of contemporary governance. We saw this in the case of oeconomy. Consciousness of the finitude and fragility of the biosphere will force oeconomy to reorganize. It is also a major factor in the imminent reorganization of the scale, methods, and priorities of governance. During the eighties, humanity finally understood that it could destroy itself not only through war, but simply by pursuing its current form of development. Yet twenty years later, "sustainable development" is still an oxymoron, as eighteenth and nineteenth-century institutional arrangements and mental habits are still firmly in place.

A scientific system resists with all its force before giving way to a new theory. Hence the saying: "Truth never triumphs; rather, naysayers just pass away." This insight is also valid for governance and oeconomy. The current system, which relies on the institutions that gave birth to it and from which it derives its *raison d'être,* will resist with all the strength that it can muster before it yields to new institutional arrangements. It was centuries before feudalism surrendered to the modern state. Today, the Westphalian state has mounted stiff resistance to genuine world governance. One of the most effective ways to resist change is to fine-tune or jerry-rig the existing system. Take the example Ptolemaic astronomy. It was based on the premise that the sun and heavenly bodies follow a circular orbit around the earth. Unfortunately, in reality, planets do not obey such elegant geometric rules. In Greek, after all, "planet" means "errant star." Over the year, they roam through the sky, following many a bizarre path. Did this lead Ptolemy's disciples to reconsider their assumptions? Not at all. Instead, they fiddled with their postulates, hypothesizing a complex system of mini-orbits that could explain the planets' non-geometric

trajectories. This way, they avoided having to call their theory into question. There is no real difference between the way in which Ptolemy's disciples tried to save their theory and the way in which we attempt to adapt our economic system to the environmental crisis through such mechanisms such as externalities and shadow prices, which hope to manage the biosphere through a market-oriented logic that is completely alien to it. Our systems of thought and institutional arrangements remind me of the phenomenon of supercooling in physical systems, when matter remains in a liquid state even when temperature and pressure levels should lead it to solidify. Supercooling is an example of a metastable equilibrium: while everything about it appears stable, in reality it is a highly unpredictable condition, in which liquids can become solids at a moment's notice. Similarly, political and economic systems only adapt to new circumstances through repeated crises, which suddenly call the existing and outdated equilibrium into question. But the important thing when a crisis strikes is that alternatives exist. European ability to emerge from the rubble of the Second World War is a good example.

Our current economy is an interesting example of "supercooling." Our mental habits and the institutional arrangements that underpin them are poorly adapted to the real conditions in which our society finds itself. In part one, I provided many examples of this problem. We are able to produce in greater quantities with ever-increasing efficiency, yet we lack a system of redistribution that allows all human beings to benefit from our collective prosperity. The cohesion and stability of our system rests on the hypothesis of indefinite growth, an assumption that is completely at odds with the planet's finite resources. The once sophisticated institution of the company has become self-referential and completely out of touch with society's most pressing goals. While finance should prepare us for the future, our financial system has no other concerns than short-term gain. We levy taxes on work, despite the fact that it is natural resources

that are scarce. Meanwhile, there is no serious momentum for change. Since the fall of the Berlin Wall, no serious alternative to the prevailing system has been proposed.

In Europe, two world wars were needed to overcome nationalism—i.e., the institutional arrangements of the past. At present, must we wait until change "takes us by the throat"[4] before we get to work transforming oeconomy's fundamental concepts, rationality, and institutional arrangements? Of course not. Sooner or later, the deterioration of the biosphere through irresponsible extraction and the ultimate depletion of natural resources, the impoverishment of biodiversity, the reckless release into nature of artifacts (such as chemical and biological products) that our system is not able to absorb, the collapse of the international monetary system, the climate change, the fierce competition to control energy sources, and tensions caused by the migrations of people fleeing old and new forms of poverty will trigger uncontrollable chain reactions. Change will take us by the throat, but by then it will be too late. Let us follow Churchill's advice, and take change by the hand—or, at the very least, be prepared to make the most of the next crisis.[5]

Neither governance nor oeconomy requires us to invent an entirely new system out of nothing. New answers can often be found by reconsidering old ideas. In some cases, old ways of organizing can be blended with new technological systems. For examples, there are new forms of corporate organization that are the offspring of preindustrial models and the Internet. Similarly, while the principle of pooling, which is central to social economy, seemed outdated a few years ago, it may, in global age, be in the process of being born anew while offering important insights in our current crisis.[6] Furthermore, societies have always proved resourceful at inventing ways to

[4] Winston Churchill said: "We must take change by the hand or rest assuredly, change will take us by the throat."
[5] Note from December 2008: "To make the most of the next crisis": And now it's here.
[6] Thierry Jeantet and Jean-Philippe Poulno, eds., *L'économie sociale, une alternative planétaire*, Éd. Charles Léopold Mayer, 2006.

manage their territories, and particularly their energy supplies, at a local level whenever equilibrium between the community and its ecosystem becomes a matter of survival. This wisdom, which was forgotten in an age devoted to the relentless pillaging of the planet's fossil resources, may soon be seen as a valuable resource. Heeding such knowledge is not a return to the past, but a reinterpretation of it in light of new technology and new forms of interdependence.

The same can be said of organic agriculture, which is a response to the eternal concern for equilibrium between man and his environment, but from the standpoint of new knowledge and technologies.[7] Eugeniusz Laszkiewicz explains for instance that the economic transformations that occurred in Poland, particularly in the rural areas, in the 1990s would not have been possible without agreements between bank cooperatives, farming cooperatives, and local authorities—the resurgence of social capital that had been buried, ready to yield new fruits when conditions had once again become favorable. [8]

The past is a well from which one can draw liberally.

1. The cost of regulation and its application to eoconomy

Another age-old problem relating to governance is the cost of regulation. In order to survive, any society must be bear – technically and socially - the cost of its own regulation. Rising costs may well jeopardize its political, economic, and social system.

All regulations have costs, be they financial, ecological, or social. Oeconomy cannot side-step this necessity. When these costs begin to rise, it often means that the existing regulatory forms have ceased to be well adapted to society. Beyond a certain threshold, taxes become

[7] Matthieu Calame, *Une agriculture pour le XXIe siècle*, Éd. Charles Léopold Mayer, 2007.
[8] Jeantet and Poulnot, *L'économie sociale, une alternative planétaire.*.

unbearable and the system begins to collapse under its own weight. It can no longer afford to regulate itself. This can occur when the system grows too quickly or becomes too complex; when the ruling class expands too much, when its needs must constantly be satisfied, and when its internal cohesion is threatened; or when it is no longer possible to raise the tribute or taxes needed to preserve the system from external threats, subjected peoples, or to preserve the biosphere itself. As the mathematician and economist Georgescu Roetgen argues, any system is invariably subject to the dynamics of the biosphere and the laws of thermodynamics. A closed system faces greater entropy, leading it to degenerate. The biosphere as a whole maintains and even increases its equilibrium because of a continual flow of solar energy. The costs of regulation and governance can be seen as the price to pay for "keeping order." In this case, order does not mean law enforcement, but a thermodynamic principle: the preservation of political and administrative structures, the financial system, communications, weights and measures,[9] the social order, linguistic harmony, relationships with the outside world, and so on.

The fall of the Roman Empire, after four centuries of imperial rule covering a significant portion of the earth, continues to haunt us. We know that the late empire was overcome with structural fiscal problems that undermined it internally, exhausted its resources, and made it vulnerable to the barbarians at its gates. At times, these invaders were even welcomed as liberators.[10] The empire's equilibrium depended on its ability to acquire outside resources through conquest. When this outside flow was cut off, the empire gradually imploded. Seen in

[9] Thierry Gaudin, a noted futurologist, points out that in our society, the cost of maintaining the entire system of measures is greater than that of research and development.

[10] See, for instance, Lucien Jerphagnon's *Histoire de Rome, les armes et les mots* (Tallandier, 2002). Historians of Rome have paid increased attention to the processes of degradation leading to its fall. For a thermodynamic interpretation of the process, see, for example, Marcel Lacroix, *La première et la deuxième loi de la thermodynamique* (Sherbrooke University, 1997).

light of contemporary communication systems, the Roman Empire's size at the pinnacle of its power was extraordinary.

Maintaining communication routes, guarding borders, and preserving commercial systems became so costly that the center could only survive by increasing taxes on the dominated regions.

I know that a comparison is not an argument; I realize that the American empire at the dawn of the twenty-first century only vaguely resembles Trajan's or Marcus Aurelius' empire. Even so, it is essential to consider the costs of governance and of oeconomy in particular. Most of history's peasant revolts occurred when ruling classes sought unreasonable tax increases because of greed, military necessity, or a concern for public order.[11]

The Soviet Union did not succumb to a foreign enemy's hostile forces. Sclerosis and the unbearable weight of its own military-industrial complex made it implode.[12] However weak they may be, African states are disproportionately large in relation to their impoverished populations. Their survival depends on a constant infusion of international aid. This cost must be assessed in relation to the service it provides and to what society can bare.

At first glance, a decentralized market economy would appear to be a cheap and efficient system of social regulation. A multitude of decentralized decisions bring supply in line with demand, guaranteeing social harmony. Yet upon closer examination, this outcome is far from certain.

Rising regulatory costs can be passed onto society in two ways. First, the entire system can be allowed to deteriorate. This approach sends the bill for current regulatory costs to future

[11] Hugues Neveux, *Les Révoltes paysannes en Europe XIVe-XVIIe siècle*, Albin Michel, 1997.
[12] Andrei Gratchev, *La chute du Kremlin*, Hachette , 1994.

generations. Secondly, rising regulatory costs can be paid for by making goods and services more expensive. At present, both approaches are taken.

The first approach is evident in our effort to preserve social cohesion through indefinite growth, while allowing our biosphere to deteriorate indefinitely. Any time growth stalls, we fear a social crisis. Maintaining growth must ultimately be viewed as a regulatory cost. We never even ask if growth in fact makes us happier. We assume it is necessary to the system's stability. Its function is identical to that of the Roman Empire's incessant military campaigns. It is a condition of equilibrium and survival. But a time invariably comes when conquests are no longer possible. The Empire becomes increasingly expensive to manage. Has growth, like Roman conquests, become unsustainable? One could argue that, over the past twenty years, consumption of energy and natural resource has been decoupled from economic growth. True, but in a very imperfect way. The overall energy and natural resource consumption continues to grow.

The resulting increase in entropy is easily measured by the fact that complex molecules arising from organic chemistry, which are found in plants or gas, are constantly transformed into simpler molecules, particularly carbon dioxide (CO2) at a much faster rate than solar energy and photosynthesis, through the reverse operation, can transform carbon dioxide into complex biomass molecules. Thus, strictly from the perspective of physics, the transition from an orderly to a chaotic world is occurring before our very eyes—and by the labor of our own hands.

The other way of measuring regulatory costs is by considering their impact on the prices of goods and services. Right now, transaction costs are rising with no end in sight. In *La mondialisation et ses ennemis* (Globalization and its Enemies),[13] Daniel Cohen analyzes the elements that make up the price of a pair of Nikes that sell for $70 in Paris or New York. Those who make the shoes are only paid about $2.75—next to nothing. If one includes all the

[13] Daniel Cohen, *La mondialisation et ses ennemis*, Grasset, 2004.

manufacturing costs (machinery, raw materials, dividends on investments, etc.), the pair of Nikes still only costs about $16. Where does the remaining $54 come from? $53.50—i.e., half the total price—goes to distribution. The rest goes towards marketing, advertising, and operating costs.

The first lesson that Cohen rightly draws from this example is that most of the shoe's value, despite being manufactured in the South, remains in the North. But one could see the mark-up as an enormous transaction cost between the producer and the consumer. This transaction costs, of course, does not dissolve, like carbon dioxide, into the atmosphere. It is redistributed, primarily into service sector jobs. Yet it does provide us with an approximate idea of the management costs involved in satisfying a need.

For a number of years, the global economy has been driven by American consumption. This can happen because simultaneously there is a permanent flow of dollars and petrodollars back into the United States, since capital-owners—individuals, institutions, or states—trust the United States to manage them. They are bound together as tightly as a hangman's noose. Like gamblers who refuse to fold lest they lose everything they have, those who put their savings into the American economic and financial system must continue to play: a mass withdrawal would bring the system to its knees, and they would lose everything they had invested. Yet he costs of keeping the system running are colossal. As I previously pointed out, in the United States, 30% of corporate profits are made by financial operators. For a system that is presumed to efficiently connect savings to financial demand, these transaction costs are incredibly high.[14]

The two billion dollars that the United States invested in the Iraq war are another way of measuring the costs of maintaining an empire. Despite its dynamism, this cost is even too high for the United States itself, which finds itself increasingly dependent on the outside world. One

[14] Note from December 2008: The acceleration of the Fall 2008 crisis only confirms this diagnostic. The Chinese government was forced to continue to buy American Treasury bonds lest the dollar should collapse, thus eliminating their main reserves, which consist primarily of dollars.

could reasonably object that this analysis is one-sided, as the United States is both the world's suction pump and pressure pump: Americans make the whole system work, so it is no fairer to ask the US to pay for itself than it is any bureaucracy. Even so, if the rest of the world was to decide, at a given moment, that the United States' financial requests were too expensive, the system would implode. Such a possibility might even be not that far away.[15]

Daniel Cohen ultimately rejects the Rome-United States analogy, arguing that with the latter, unlike with the former, prosperity arose from a capacity for invention. I do not entirely follow his reasoning. The United States, and to a lesser degree Europe (with what is known as the Lisbon strategy[16]) claim that they will be able to maintain their prosperity in the future thanks to the competitive advantage of their technological skills. I have already shown why, in the case of China, this belief is illusory. Furthermore, this so-called technological skills depends solely, as the bitterness of intellectual property negotiations demonstrates, on the privatization of knowledge—knowledge which clearly should be allowed to circulate freely.

The cost of this stranglehold is that it deprives others of their right to develop. This deprivation is further evidence of oeconomy's existing management costs. Disruptions will inevitably occur. These may not involve a Roman-style fiscal crisis. But they could involve a general revolt against intellectual property laws. If such an insurrection occurs, drones and laser-guided bombs will be as impotent as in Iraq. Put differently: an economy that wastes scarce natural resources while imposing restrictions on abundant resources (knowledge and the diffusion of innovation) is far from being optimal. There is little chance it will survive.

[15] Note from December 2008: Since this chapter was written in 2007, the moment of this implosion has become considerably closer.

[16] The Lisbon Strategy refers to the major economic and development policy program of the European Union between 2000 and 2010. Its goal is to make the European economy "the most competitive and dynamic in the world."

In part one, I mentioned how frequently capitalism's imminent demise has been predicted, and how, like a modern phoenix, it has repeatedly risen from the ashes to adapt itself to new circumstances. Predictions of a new systemic crisis may thus leave many unmoved. In one of his books, Paul Thuillier has his imaginary narrator, writing in 2081, express astonishment that late twentieth-century Western society, despite its knowledge and scientific achievement, was unable to predict the "great implosion" that, in his story, occurred between 1999 and 2002.[17] "Let's be honest," he adds, in a long interview for the journal *Les humains associés*, "it is possible that the system could live for a while longer. But I am convinced that we are at the end of a cycle and that a serious crisis awaits us. There are moments when change is particularly sudden and brutal."

What I find striking is that so many distinguished specialists refuse to see reality as it is. Perhaps this is typical of periods of crisis. In 1788, French aristocrats applauded Beaumarchais' *The Marriage of Figaro,* but refused tax reform.[18] Bernard Lietaer, in his report to the Club of Reform, says that the dollar is very likely to have a "hard landing."[19] Since 1971, when its gold convertibility was suspended, the dollars has been international trade's primary currency, even despite the fact that it is managed by the United States alone.[20] In any other country, the international scale of the combined American deficits—the budget deficit and the trade deficit—would have provoked a major financial crisis. But Chinese, Japanese, South Korean, and Saudi holdings of US treasury bonds are so extensive that none of these countries has anything to gain

[17] Pierre Thuillier, *La grande implosion: rapport sur l'effondrement de l'Occident, 1999-2002*, Hachette, 2002.
[18] Note from December 2008: The systemic crisis has occurred. One need wait until 2084 to express surprise at the incredible shortsightedness of banking and financial leaders, or at the naiveté with which Alan Greenspan, acting like a guru, declared that he had overestimated the market's capacity to regulate themselves.
[19] December 2008: What progress we have seen recently: The largest banks have begged states for assistance, and their leaders, like great lords, have renounced their annual bonuses—even as they lay off workers left and right!
[20] Bernard Lietaer, *Monnaies régionales*, Éd. Charles Léopold Mayer, 2008.

from seeing their breathtaking savings vanish into thin air. But for how long can this continue?[21] In early 2008, the subprime crisis and the dollar's collapse seemed to suggest that the whole system was about to go belly up. And what would happen if poor or emerging countries one day decide to nationalize private investments made by transnational firms form the so-called developed countries, and refuse to pay their debts as long as rich countries don't pay their own, "ecological" debts?

2. Oeconomy Must Seek Inspiration from Governance's Fundamental Principles

Governance can be considered from several angles: its general goals (how does one ensure society's cohesion, human development, and peace?); its institutional arrangements (the nature and functioning of various institutions, kinds of political regime, checks and balances); its actors (citizens, bureaucrats, political personnel, companies, parties, etc.); its realms (education, defense, health, housing, solidarity, the environment, and so on); its scale (from local to global); types of goods and services delivered (commercial and non-commercial, public and private); its mode of action (budgets, norms, redistribution); evolutionary dynamic (forces of inertia, reform strategies, adaptation processes); general principles (legitimacy, democracy, the relevance of government institutions, the shared production of public good, the articulation of various scales of governance). The same can be said of oeconomy, which is a specific branch of governance.

This variety of possible perspectives has led to a nearly limitless expansion of specialized disciplines, ranging from company management to the organization of the labor market and the

[21] December 2008: China, while supporting the dollar, has proposed to its Asian neighbors that exchanges be denominated in their own currency rather than in dollars.

analysis of production systems, via business law, environmental economics, global economic regulation, industrial policy, local economics, the dynamics of innovation, and currency theory.

In keeping with my intuition, I decided it would be most useful, in conceptualizing a twenty-first century oeconomy consistent with the specifications I laid out, to concentrate not on what is unique to economics—the production and distribution of goods and services—but, rather, on the fact that economics is only one branch of governance—one that obeys the same general principles and pursues the same goals.

I will also, naturally, need to take into consideration what one might call the substance of economics: the various factors that are incorporated into the production process and the goods and services that are offered to society. "Inventing a twenty-first century oeconomy" cannot be done by waving a magic wand. It is the outcome of trial-and-error and debate. What follows is a modest contribution to such an effort. I personally am very far from proposing a new economic doctrine that could replace the one that prevails today. Rather, I have tried to let the reader participate in my own quest, as I test the fruitfulness (which strikes me as real) of this unusual starting point. Since these "general principles of governance" will serve as my guiding thread, let me say a few words about their origins and contents. They grew gradually out of forty years of professional experience, first as a practitioner (as a French civil servant, between 1968 and 1988), then, for twenty years, as an observer and actor (as the director of the Charles Léopold Mayer Foundation for Human Progress, which has given me the rather unique opportunity to observe—and, at times, to help change—the way society is managed and governed at different levels and in different locations).

My first conviction, drawn from this experience, is that governance is an eternal question, central to every society's survival. Across the ages and on every continent, the goals pursued by

governance are strikingly similar. Their concrete modalities, however, vary greatly in relation to cultural context, the challenges each society faces, available technology, the degree of interdependence, the fragility of the natural environment and the constraints it imposes on society (i.e., the roles played by water and energy in social organization), and, last but not least, the circumstantial factors (such as the relative lucidity of governing elites) which make human history unpredictable.

My position on governance is thus a little like that of anthropologists of law like Etienne Le Roy (whose approach I admire), who seek law's unvarying functions beneath the infinite variety of its concrete forms in different societies.

It is thus through a resolutely comparative approach that I discovered the extent to which, in different societies and at different levels, basic problems are similar, which in turn allowed me to gradually identify five general principles of governance.

The first principle concerns power's legitimacy and the degree to which governing practices are culturally rooted. For a society to function, people must consent deeply to way in which they are governed. Lu Jia, the Neo-Confuciain philosopher, made precisely this point in his *New Political Principles,* written for the edification of the first Han emperor.[22] For consent to be deep-seated, authorities must be deemed trustworthy; restrictions on private freedoms must be clearly limited to what is justified by the common good; and social organization must rest on a shared ethos that everyone—the powerful as well as common folk—practices as much they preach it.

The second principle is respect for democracy and citizenship. All must see themselves as full-fledged stakeholders in a common destiny. By democracy, however, I'm are not necessarily referring to the Western conception of it. Collective decision-making processes aimed at

[22] Lu Jia, *Nouveaux principes de politique*, Zulma, 2003.

producing consensus represent the democratic ideal far better, in most cases, that the tyranny of the majority. Everyone wants, as the Africans put it, to make sure that his or her "mouth is there." In other words, we all want our point of view to be heard, respected, and at some level acknowledged. As for citizenship, we mean it in the Greek sense: not as an entitlement to rights resulting from membership in a particular community, but as a balance of rights and duties and of powers and responsibilities. These alone can ground community membership. Democracy and citizenship mean that power can never be exercised with impunity or in the absence of popular consent.

The third principle is that of multi-level governance. By multi-level, I mean the bonds between the local and the global, between different levels of governance, and between the individual and the world. Governance is ultimately nothing but a vast structure through which individuals—their passions, their interests, their history, their hopes—are integrated into a world system comprised of human society and the biosphere. The integration of the individual into the world cannot happen in one fell swoop—i.e., by the immersion of the individual into an undifferentiated society governed by uniform rules. Governance organizes relationship between the individual and the world by a layering of governance levels, from one's immediate community to the planet as a whole. Yet grassroots communities can only be granted autonomy to the degree that global social cohesion is not thereby threatened. Various kinds of regulation can achieve this. Fitting the parts into the whole is one of oeconomy's oldest meanings. "Animal oeconomy" refers to the arrangement of various functions that procure an animal's overall well-being. This organic metaphor is one that political and economic thought has never been able to completely abandon. Today, companies offer examples of multi-level integration, through which an entire supply chain, extending from workshops and basic production units to the system as a

whole, is integrated into a single process. Devolving specific roles to each governance level and articulating these levels into a coherent whole is one of governance's most distinctive characteristics.

The fourth principle is the requirement that a society's major actors and institutional arrangements be competent, relevant, and efficient. Let us reflect for a moment on the concept of institutional arrangement, which we will consider in depth later on. Governance is put into practice by actors, who themselves are caught up in a network of relationships. These relationships are generally stable. Stability, which is essential to society's survival, is achieved through rules and training. This is the complex edifice, the heir of a rich historical legacy, in which governance still operates.

I prefer to speak of institutional arrangements rather than of institutions, as the term "institutions" restricts and ossifies the phenomenon, while that of "arrangements" captures its elasticity: when one pays too much attention to institutions, the state is conflated with governance *tout court*, and the company is assumed to encompass the entire production process. Yet these institutions, like animal or plant species, are neither self-evident nor monolithic. They are not self-evident because they are the outcomes of particular historical processes; nor are they monolithic, because institutions are not homogeneous but riddled with contradictions. Moreover, an institution's internal functioning can be analyzed in similar terms as relations between institutions. The notion of institutional arrangements emphasizes the deep continuity between each institution's internal structure and inter-institutional relations. What matters for governance is that institutional arrangements fulfill the tasks that they have been assigned. Consequently, an institutional arrangement must be evaluated in terms of its relevance: that is, in terms of its spontaneous ability to accomplish the tasks that it has been assigned.

The fifth principle, finally, is cooperation and partnership. All actors must be able to work together for the common good. Governance organizes the relationships and cooperation between various kinds of actors and between different governance levels, according to commonly agreed upon procedures. It matters little whether these procedures are codified into rules or are simply established through habit and training.

3. Governance and Oeconomy in the Age of Globalization

Governance is naturally suited to operate at the level of relationships based on interdependence, or what we might call "communities of destiny." Interdependence between societies and, at a planetary level, between humanity and the biosphere has become irreversible. This is the very definition of globalization. Our solidarity is physical even before it is moral. We are each dependent on those around us. The planet itself has become our hearth—our *oikos.* The implications for governance are enormous, not least because the term's traditional meaning has changed. In "Old Europe," governance was usually confined within national boundaries and was often identified with the state. In France, the identification nation and state has historically been very strong, as the idea of the republic "one and indivisible" suggests. As a result of these historical traditions, the idea of a "community of destiny" seems, in Europe at least, so self-evident that it barely needs mentioning.

As for economic globalization, it has been around for some time. The great Dutch and French "Indies" companies were already intercontinental operations three centuries ago. Openness to foreign trade was as great in 1900 as it was in 1990. All the same, things have clearly changed to a significant degree. We like to think of our major corporations as "national

champions." The idea that the internal market will launch our champions onto the world market is largely taken for granted. In 2006, the merger of two major steel corporaitons, Mittal and Arcelor, dominated French headlines. Yet neither company had headquarters in France. The Indian "conqueror," Lakshmi Mittal, was in fact British—yet its corporate headquarters was not even located in the European Union. Arcelor was created through a series of mergers, including that of the two French steelmakers, Usinor and Sacilor, which themselves, over the decades, had absorbed dozens of competitors. But Arcelor's CEO was French. Nothing more was needed for Arcelor to be a "national champion." We still think in terms of "national communities of destiny." Despite our increasing engagement with the world and all the concession of sovereignty we have made to the European Union, we stubbornly cling to our nation-states, seeing global society either as an abstraction or as a market to be conquered.

We still think of the "international order" and of world governance in terms of negotiations between sovereign states, as much when it concerns international security as when it relates to world trade. Lumping together existing communities is insufficient to the task of creating higher-order communities. One of governance's major functions—and the same applies to oeconomy—is to create new communities, not merely to manage existing ones. Consequently, whatever rules one would like to see oeconomy implement (it should be clear that I am not a strong believer in globalization premised on neoliberalism), governance falls short of one its core duties when it treats the planet as something else than it domestic sphere, and when it fails to make establishing a global "community of destiny" as its primary responsibility. This community's equilibrium must be conceived from two perspectives: equity and solidarity. The practical implications of this position will be considered later. For now, I will restrict myself to

imagining what this system might look like when fully developed. This will make it possible to draw several important conclusions.

Such a community will inevitably lead to an equitable distribution of the planet's natural resources. As I have already stated, a major redistribution of wealth between the world's regions is underway. Let us try to imagine the world in the late twenty-first century, presuming it has survived our greed and negligence. The debate over unfair competition between rich and poor countries will long be forgotten. The illusion that Europe and the United States could continue to mobilize the lion's share of the world's resources through their technological superiority and monopoly of intellectual property will have vanished long ago. India and China will have reacquired the status they had in the seventeenth century: they will possess their fair share of the world's wealth. Each country's ecological footprint will be in line with what the Earth can sustain, which is about eight times less than the current American lifestyle. Intangible resources will circulate freely. Is this scenario utopian? No: it is the necessary condition for humanity's survival. Consequently, the question that the early twenty-first century faces is that of conceptualizing an oeconomy that can pave the way for this transition.

If our lifestyles are made more harmonious with the basic principles of ecological justice, will international trade then cease to exist? Or, returning to its origins, will international trade be based entirely on each region's natural comparative advantages? I do not believe so. One has only to consider our present situation: with the notable exception of oil, most international trade occurs between OECD members. Europe is the best example.[23] The "Europe of fifteen," prior to the enlargement that brought in Central and Eastern European countries, already comprised 40%

[23] Daniel Cohen, *La mondialisation et ses ennemis*.

of international trade, but two thirds of member states' imports and exports went to or came from other member states.

Though economies of scale will occur less frequently than in the past (for reasons I shall explain shortly), some will continue to exist. Trade, insofar as it is consistent with a reasonable level of energy consumption, will continue to diversify the supply of goods and services. On the other hand, compared to today, a much larger share of production will occur at the local level, even as oeconomy plays a major role in establishing a united global community. In other words, oeconomy will almost certainly evolve along the same lines as other aspects of governance: a model emphasizing a single level—the state—will be replaced by a multi-level system in which territorial management on the one hand and global management on the other will assume far more important roles than they did during the second half of the twentieth century.

We have traditionally considered homogeneity and unity lie "within" communities, and heterogeneity and otherness are found "outside." "Us" vs. "them," civilization vs. barbarism: such has been our dominant framework. The same reflex is apparent in the way we defend our so-called "national champions" (such as Arcelor): in these cases, we set domestic competition and social tensions aside, uniting around the defense of our national interests. Yet particularly in Europe, the demographic changes of the past fifty years and mass immigration have radically changed this outlook. Diversity and heterogeneity are now found at home. Unity is the destiny of humanity as a whole; diversity is something that can be found in every community. The same goes for oeconomy. Part of the population participates in the world market's vast game. Some do so in an active and voluntary way: they are extremely qualified and mobile, and are able to take advantage of their mobility to their own career opportunities. Some do so in a passive and involuntary manner, simply by working for production units that compete on the world market.

But an even larger share of the population participates in an oeconomic and social sphere that remains locally rooted, such as services for individuals, small-scale craftwork, or public services. In such circumstances, is there really a national or local "community of destiny"? This is a fair question. However, the existence of a global "community of destiny" is self-evident. It is apparent in the ecological imbalances that affect everyone—climate change, the decline in biodiversity, the depletion of fish stocks, etc.—and in the need to share scarce natural resources. As communities become less "natural" and "self-evident," the question of oeconomy's legitimacy—meaning both its rules and its leaders—must and will be asked with increasing intensity.

Oeconomy, like governance, must be seen as a conscious and deliberate "macro-regulation" of the world system. Each of its facets must serve an essential social goal. Oeconomy in no way sees itself as "natural law"; consequently, its conception of how the system should be regulated must be described. Its goal is that at the end of each historical cycle, society and the biosphere find themselves in a comparable or better state than they were at the cycle's outset. As oeconomy's definition reminds us, it seeks to "ensure humanity a maximum degree of well-being through the optimal use of technical capacities and human creativity, while being unwaveringly concerned with preserving and enriching the biosphere and with conserving the interests, rights, and capacity to act of future generations."

To explain what we mean by a "better state," we must describe the state of the system at moment T; characterize its basic parameters; describe, during the cycle T-T+1, what society does and how much well-being results; and, finally, describe the system at moment T+1. This means that oeconomic activity is not measured by flows of goods and services but by qualitative variations. From this premise, a number of consequences follow.

First, on their own, the direct consequences of economic activity offer too narrow a perspective. One must also consider indirect effects. Take the example of finance. It is not enough to describe the actions of bankers and stockbrokers; one must also consider the broader consequences of the "financialization" of the world. Individual financial middleman are not responsible for these effects; their entire profession is.

Second, the tools through which we measure human activity in terms of flows, notably gross domestic product (GDP), which neglect changes in our resource inventory and the very quality of the system, are ill-suited for understanding oeconomy.

Third, globalization implies a regulation of the system at a higher level. In a few years, we have evolved from a need for local regulation to a need for global regulation.

Which components of the system must be taken into account to describe its regulation and its improvement between time T and time T+1? As I see it, there are three:

- Intangible, tangible, human, and natural "capital": They are the result of centuries and even millennia of accumulation. Humanity's future survival and prosperity depends on their maintenance and development;
- Individuals: Their values, passions, and spiritual, intellectual, and material resources.
- What one might call, by analogy with self-organized systems, society's "emergent properties": Its cohesion, its ability to adapt and to invent rules, and the existence of shared standards.

In our global bio-socio-technical system, coherence can be found, as it were, on both ends of the spectrum: in individuals, at one end, and in the system as a whole, on the other. Both levels involve multiple goals and the need to combine them. One of the challenges faced by governance in general and oeconomy in particular is the need to invent the "middle": that which

unites the actions of each individual to every other in a common act, and which ultimately keeps them in a state of equilibrium. This "middle" might be described as the intermediate level of integration. They are characteristic of governance.

4. Art of Governance and its application to Oeconomy

Governance is an art. What is the difference, one might ask, between a science and an art? With art, the proof, as they say, is in the pudding. I would now like to present four ways in which the art of governance can be applied to oeconomy: in reconciling unity and diversity; in managing relationships; designing processes; and in combining different regulatory levels and forms.

Reconciling Unity and Diversity

The art of reconciling unity and diversity, cohesion and autonomy, results from governance's very nature: it is the art of living together, whether at the level of local communities or on the planet as a whole. Society's overall cohesion must be achieved by offering each of its members a maximum degree of freedom and autonomy. Any community, whatever its size, is pulled between these two needs: cohesion and autonomy. The art of governance consists in imposing on local communities no more restrictions than are needed for the sake of the common good.

One of the ways in which governance reconciles unity and diversity is by integrating different governance levels. I developed this point in detail in a previous book.[24] The basic idea is as follows. No social problem can be dealt with at a single governance level. The solution

[24] Pierre Calame, *La démocratie en miettes* (see the chapter on "Relations between Governance Levels: Active Subsidiarity").

always depends on coordinating action occurring on different scales. The principle that should guide the coordination of various governance levels is active subsidiarity. According to this principle, the constraints that a "higher-level" collectivity (i.e., international institutions or a nation-state) imposes, in the interest of social cohesion, on "lower-level" collectivities (i.e., a region or a town) must be results-based rather than means-based. A "means-based" constraint is one that requires a goal to be met in a specific way, typically involving the implementation of a detailed set of rules. It thus places considerable restrictions on the freedom and autonomy of "lower-level" communities. "Results-based" constraints, however, lay out the goals that must be achieved to ensure social cohesion, but leave it up to the communities themselves determine how best to achieve these goals, particularly given their own needs and preferences.

The principle of active subsidiarity has yet to be applied in our own economic system. Take the example of the European Union. The European Commission has made the organization of the internal market its main priority. Its efforts to build Europe consist largely in increasingly arcane and fussy directives. Admittedly, the word "fussy" may not do justice to the work of European legislators, who never intended to regulate for regulation's sake. However, unity has been consistently emphasized at diversity's expense.

Even getting the European Commission to recognize a few basic principles—such as the right of services of general interest (SGI) to be shielded from market pressures and the acknowledgment that many social problems are poorly served by commercial models—proved a struggle. Fortunately, the "European social model" was too well established and beloved of Europeans to be thrown overboard simply because it contradicted the sacrosanct principle of free trade. Even so, not until the European Council approved the Lisbon Treaty in 2007 were services of general interest (SGI) placed on a constitutional footing. The European Commission's 2006

report on "Social Services of General Interest in the European Union" was a notable turning point. After widespread consultation, it finally embraced the reality principle. In a nutshell, it said: let's deal with the world as it is and let's deal with social problems as they are—and let's not force liberal economic dogma on them when it doesn't work. This is a good example, incidentally, of the principle of active subsidiarity gaining a tenuous oeconomic foothold: "[The directive concerning public service contracts] requires contracting authorities [usually local government] to establish technical specifications for contract documents […] Certain Member States and service providers have pointed out the difficulty of establishing in advance a precise description of the specifications for social services, which must be adaptable to the individual circumstances of persons in need. To overcome this difficulty, technical specifications may be established on the basis of performances and functional requirements. This means that the contracting or awarding authorities may decide to define just the aims to be achieved by the service provider." In other words, the imperative that social services be adapted to a wide variety of situations necessitates results-based rather than means-based governance.

The application of the principle of active subsidiarity to production and trade is essential to oeconomy. It is one of this book's recurring themes. For now, I will just mention two relevant points. The first concerns the right of local communities to draw on untapped human energies to meet unsatisfied needs. If this right is rejected in the name of free trade, then free trade will lose its legitimacy. It may be justified in theory, but it will be rejected by common sense. The second point concerns the diversity of goods placed on the market. Too often, the "container" is more diverse than the "content": the shape of the bottle is what allures consumers and clinches their loyalty. But a wide variety of bottle shapes also prevents them from being immediately recycled.

Yet it would be entirely possible to normalize bottle shapes, making them immediate recycling possible, and to focus on the diversity of content instead.

Managing Relationships

The more a society is complex and interdependent, the more it depends on the management of relationships. No problem can be dealt with at a single level of governance. Most problems, moreveover, can only be dealt with through different kinds of actions. Ending social exclusion depends, for instance, on education, health, housing, the labor market, entrepreneurship, and so on. Health issues depend on education, housing, continuing education, the environment, as well as the development of a sophisticated medical infrastructure, despite the fact that it already consumes the vast majority of public and private expenses. Recent studies suggest that medical infrastructure accounts for only 11% of a population's health. Other factors relate to lifestyle and genetics.[25]

Industrial ecology (discussed in part one) provides a good example of what relationship management means for oeconomy. An "immature" ecological system is characterized by extensive exchanges with the outside and weak exchanges on the inside, while a "mature" ecological system is more sophisticated in that it seeks to bring internal cycles to completion. In other words, a "mature" system "thickens" relationships, allowing it develop with minimal recourse to external energy, raw materials, and waste disposal options.

Traditional governance consisted of divisions. It was always building fences: between different governance levels, between public and private actors, between bureaucracies, between political power and bureaucratic power, between the formulation of public policy and its

[25] Personal exchange with French health minister Xavier Bertrand, 2006.

oversight, between the providers and the users of public services, and between the experts and the ordinary people. Governance replaces each these fences with a bridge.

The same revolution that has taken place in governance must also occur in oeconomy. Our existing economy is very good at amputations—beginning with the very idea of human being itself. Economic theory takes the complexity that is a human being—with its many and contradictory aspirations, its needs for both material satisfaction and a meaningful life, its yearning for recognition, and a desire for cooperation as well as competition—and extracts from it an uncomplicated and purely rational *homo economicus,* motivated only by the pursuit of material interest and (as *homo laborans*) selling his abilities to the highest bidder.

Another idea amputated by contemporary thinking is that of economic actors. We are constantly lectured that companies are only socially useful by when they make maximizing their own profit their highest priority. Oeconomy's gambit is, however, precisely the opposite: to imagine institutional arrangements that combine different types of capital and goods and different goals. Solidarity economics tries to do this. As its defenders rightly point out, solidarity economics endeavors to ensure social cohesion while at the same time producing a range of goods and services. It also seeks to achieve well-being, social justice, and solidarity simultaneously. Corporate social and environmental responsibility (CSR) also implies the recognition that different goals can be pursued simultaneously. We are beginning to run up against classical economics' fundamental contradiction. Who can really say with straight face that they are concerned with the "triple bottom line" (the three "Ps": people, planet and profit) while insisting at the same time that their main concern is to keep their shareholders happy? We alternate between schizophrenia (i.e., the left hand does not know what the right hand is doing) and hypocrisy ("what I do is not what I say"). In governance as with oeconomy, imagining

institutional arrangements that simultaneously pursue multiple objectives is, we can all agree, an essential priority.

Finally, our current economy amputates relations between actors. Classical economic theory puts forward the following postulates:

- Public and private actors operate in completely different worlds;
- Relations between companies consist of several basic forms: control (as with branches); purely commercial relations (as with clients, suppliers, or sub-contractors); and competition.

Fortunately, these postulates are false. In all domains of economic life, more or less stable configurations of relationships are established. To draw a comparison with natural sciences, one could say that we live not in a universe of perfect gasses but in a beaker full of living beings existing in colloidal states that consist of connections and relationships of varying degrees of intensity. Competitiveness between nations and territories depends to a considerable extent on the ways relationships and cooperation between private and public actors is structured. At the national level, the United States, though it presents itself as champion of economic liberalism, has no qualms about pursuing an active industrial policy. By analyzing China's development, I have shown that the compactness of its governing class, which frequently leads to collusion between local public authorities and economic interests, makes it both a model of bad governance *according the the World Bank's criteria* and a case of economic efficiency.[26]

Companies belonging to production and distribution chains do no waste their time reshuffling their cards—i.e., changing their suppliers and clients. This would increase their transaction costs, deprive them of critical learning processes, and, in the end, fly in the face of the truth that relationships based on trust are as essential to economic life as to social existence.

[26] Pierre Calame, "Le contre exemple asiatique," *op. cit.*

These chains can be thought of as long organic molecules, with chains that may be more or less strong but which are each nonetheless essential.

The same kind of interaction exists between buyers and sellers. Ikea was ingenious to have invented the slogan: "We're going to put you to work!" In this outlook, the buyer becomes the builder's partner. Similarly, the "fair trade" movement is an effort on the part of the buyer to control production conditions. Consumers thus become "consum-actors"! Where could they find such opportunities when they were simply a *Homo economicus*?

Finally, to reduce the relationship between companies producing the same goods and services simply to one of competition is sheer fantasy. In any living system or society, complex relationships based on cooperation, competition, imitation, selfishness and solidarity are forged. These examples suggest that in governance as in oeconomy, much is to be gained by emphasizing relationships instead of divisions.

Consider, finally, the creditor-debtor relationship. According Michel Albert, two capitalist traditions coexist, often blending together in specific countries: in the Germanic model, companies use bank loans to satisfy their long-term financial needs, while in the Anglo-Saxon model, companies raise capital by turning to financial markets to raise stock value, increase capital, or to reorganize family-held companies into publicly-traded corporations.[27] At first glance, both alternatives would appear, from the standpoint of relationships, equivalent. Recourse to financial markets might even seem preferable, as doing so unites a company's shareholders (i.e., its co-proprietors) in a joint venture; on the other hand, a relationship with a banker, whose role is simply to determine creditworthiness, is not really a bond per se. But this conclusion overlooks that financial and liquidity markets are premised on the ability to buy and sell shares on a market that may be located half way around the world. Such companies really

[27] Michel Albert, *Capitalisme contre capitalisme*, Seuil, 1991.

become, in every sense of the word, "anonymous" ("anonymous company" being the term used in several European languages for "corporation"). The new "co-proprietors" know nothing about the company, its leadership, or its employees. Buying and selling is driven solely by profit and by the need for returns on investments. In Paul Dembinski's words, relationships become transactions.[28] Unlike relationships, which are lasting and personal, transactions are immediate, anonymous, and abstract. The process of the "financialization" of the world has reinforced this shift to transactions and completely abstract forms of interaction. Banks and wealth managers sell their clients investment products that bundle together shares from a vast array of corporations. Clients buy slices of these investment products, rather than shares of particular companies. Financial managers, in turn, are evaluated on the short-term profits they generate. The old relationship (a traditional feature of provincial life) between a rich old lady and her banker—who was at once her agent, accomplice, and confessor—becomes nothing more than transactions between asset managers. The shift to a transaction-based economy is completed by the emergence of numerous derivatives: one no longer buys a share, which is actually "part" of a company's wealth, but an "option" to buy one at a certain date—which can, in turn, be sold.

Anglo-Saxon capitalism would appear to have prevailed. Transaction reigns triumphant. Relationships seem quaint and old-dated. Yet it is not entirely clear that this paradigm is on its way out. I will return to this point when I discuss the Sarbanes-Oxley Act adopted by the US Congress in the wake of the Enron scandal. This law is intended to punish executives who do not know what their companies are doing and bankers who do not know to which companies they are loaning money. The US subprime scandal revealed an even deeper problem: with the securitization of loans, which themselves are wrapped into incredibly complex bundles, banks offered their customers financial products they didn't understand themselves, making it

[28] 28. Paul Dembinski, *Finance servante ou finance trompeuse*, Parole et Silence, 2008.

practically impossible for their clients to determine their risk exposure. This is what businessmen call "buying a pig in a poke." Numerous efforts have been launched to control these practices. Though they have different origins, these endeavors could well converge.

The first origin is legislative and regulatory. Along the lines of the Sarbanes-Oxley Act, it requires bankers and asset managers to have basic knowledge of their companies' investments and risk exposure. In the subprime crisis, the principle that major financial institutions should regulate themselves, as provided for in the Basle II accord, clearly failed.[29] An at least partial return to public regulation is thus inevitable. It will re-inject a dose of personal awareness of risk, and thus a measure of the relationship principle, into financial management. By the same token, sovereign funds, which in 2007 already managed $2,500 billion according to Morgan Stanley,[30] became key partners, in the spirit of Norway's Government Pension Fund-Global, which have now become strategic investors. Most of these funds come from oil profits. To appreciate how much they have grown, one must remember that the market for Euro-dollars, one of the essential elements in the shift to "financialization" in the 1970s and 1980s, was the result of a sharp rise in oil prices. A similarly brutal increase in 2007-2008 seems, however, to have entailed more sustainable economic positions. The revenge of old-fashioned capitalism was emphasized by an article in *Le Monde* from July 6, 2008, entitled: "Grandpas Overshadow Young Hotshots." Great traditional investors like Warren Buffet in the United States and Albert Frère in Europe have begun to eclipse young traders and others adventurers of the era of transactions.[31]

[29] See, for instance, the contributions to the seminar on "The International Financial System and Peace," organized by Economists for Peace and Security (EPS) and the Initiative pour repenser l'économie (IRE) in June 2008, www.i-r-e.org.
[30] See the Wikipedia article on "Sovereign Funds."
[31] Note from December 2008: The financial and economic crisis of the second half of 2008 has confirmed this analysis. The "transaction" landscape is in disarray. The mutation of a financial crisis into a serious economic crisis is a consequence of a general collapse in trust between actors. Trust, however, is the very basis of relationships.

On the other end of the spectrum is Muhammad Yunus, the founder of Grameen Bank, whose international reputation was established when he received the Noble Prize in 2007. Microcredit's principles are founded on relationships of trust, in that loan are guaranteed on a collective basis. This is the classic framework used by mutual aid society or by loans within immigrant communities (particularly the Chinese). The group's own enduring relationships are what ultimately guarantee this kind of credit. Oeconomy must thus be founded on the management of relationships.

Designing processes

To characterize modern governance, I spoke in my previous book of a "new tripod" (just as one might speak of a "new footing").[32] Governance's traditional tripod consists of institutions, competencies, and rules. Institutions are social organizations with distinct boundaries. They have an inside and an outside. Consequently, they lead one to focus on each actor in isolation, rather than on institutional arrangements, which emphasize relationships between actors. Each actor is endowed with its own competencies; each institution pursues a single goal. Finally, individual behavior and relations between institutions is governed by rules. This type of governance is suitable for a world that is stable, and whose regularity makes it possible for all conduct to be codified. It is space of separate, delimited entities. But this foundational tripod is poorly suited for a complex world, where everything is always on the move, and where one's goals must constantly be reevaluated to assess their suitability to prevailing institutional arrangements. For this reason, a new governance tripod is needed, based on goals, ethics, and work methods.

[32] Pierre Calame, *La démocratie en miettes* (the chapter on governance's constitutional foundations, p. 140 ff).

"Goals" refer to the fact that a society must constantly reconsider its very reason for being, its *raison d'être.* In the case of oeconomy, goals could include the pursuit for well-being (rather than material accumulation), the preservation and enrichment of the biosphere, and the preservation of the interests, rights, and abilities of future generations. These are the touchstones on which institutional arrangements and work methods can be assessed.

"Ethics" means the values that underpin a society's interactions. They are the stable guidelines that make relationships and mutual trust possible.

Finally, "work methods" are about "how you get something done." They include institutional arrangements, but also mutually agreed upon practices to make them operational, often through training and cooperation.

It is worth noting that these ideas are not at all alien to the business world. Over the last thirty years, businesses have found themselves confronted with a world that is far more uncertain and fluctuating than the old world of national economies. Consequently, they have had to think increasingly in terms of strategy rather than planning. Planning was typical of the old tripod: one knows who makes decisions, how the plan is approved, and who, thanks to the plan, is responsible for how the system operates. Strategy involves a more projective approach: confronted with uncertainty, one must never lose sight of one's primary goals. And collective work means that one must know what one expects of others. Roles are not determined in advance. They are reinvented on the basis of current needs, and depend on a shared ethos and shared experiences. A common vision brings a group together. In short, companies must conceive of processes that allow them to define a strategy on which everyone agrees.

Classical economic theory, by defining the rules of competition that lead to the optimal collective good, is fighting the last war. It now consists of many agreements that actors have made to produce satisfying solutions.

To make an analogy with mathematics: classical economics is based on a system of equations, the resolution of which makes it possible to reach an absolute or relative optimum. Oeconomy, however, is based on algorithms, which make it possible to reach satisfying solutions.

Multi-level Governance and Oeconomy

The art of governance can in no way be reduced to laws, taxes, norms, constraints, and prohibitions. A system of governance is above all an ideology, in the noble sense that Paul Ricoeur gives the term: that which holds men and society together. Straightforward control is not governance, at least not in the long run. You can't put a guard, an informer, or a police officer behind every individual. Even a totalitarian regime must convince its opponents that they did something wrong, and at least part of the population must embrace the reigning ideology. A regime cannot last without some legitimacy in the eyes of the population. Excessively centralized regulations stifle themselves. The best regulations are "organic" in nature, in that they are woven into the very fabric of the system. I referred previously to Jacques Sapir, who prefers to speak of a "decentralized" rather than a "market" economy. He makes an important point: regulatory decentralization, which devolves rule-making to each producer and each consumer, is so much a part of our daily lives that we barely notice it. Yet it is what makes a liberal economy so efficient. I have long been impressed by the theories of the Russian physicist Victor G. Gorshkov, particularly by his ideas about the role played by huge natural ecosystems or "biotas"

in the environment's spontaneous ability to stabilize itself (one of these biotas is the Siberian steppe). Why is it, he asks, that ecosystems, and particularly our planet itself, preserve their basic forms over time—a fact that is all the more surprising when one considers that an ecosystem's stability depends on a very large number of variables (most importantly temperature) fluctuating within a very narrow bracket, despite the many pressures that, without a self-stabilizing mechanism, would push them outside of it?[33] In a sense, this is a generalization of the classic problem of how to maintain human body temperatures between 36° and 40°, when outside temperatures are capable of varying between – 40° and +40°. In the case of the environment, Gorshkov, through his analysis of "biotas," shows that equilibrium is the result of a long-term selection process, which he calls "natural stability selection," through which different species cooperate to preserve their external environment in an optimal state. A process of natural selection based on competition would, on the other hand, result in environmental destruction as well as a single conquering species. In analyzing the stabilizing mechanisms, Gorshkov emphasizes that every cell of every creature belonging to the ecosystem participates in the process. This implies, according to his calculations, an overall information computing capacity that is ten-to-the-power-of-twenty times greater than our own.

I am aware that drawing parallels between the ways in which society and ecosystems operate might seem reckless. But it would be wrong to ignore the algorithms that make it possible for the components of a complex system to converge or not converge (or even to self-destruct). In his provocative book (discussed above), *The Origins of Wealth*, Eric D. Beinhocker of the MacKinsey Global Institute considers, in a similar spirit, the ways in which computer simulations can explain real economic dynamics while completely dispensing with the

[33] Victor G. Gorskhov, *Biotic Regulation of the Environnement: Key Issue of Global Change*, Springer, London, 2000; see, too, the Biotic RegulationWebsite : www.bioticregulation.ru.

hypotheses about equilibrium which, since Walras, have founded classical economic theory.[34] How does this relation to Gorshkov's "biotas"? Both are efforts to account for the ways in which billions of interactions between agents are—or are not, as the case may be—creating a regulation at a macro level.

This is why oeconomy depends on a multiplicity of regulatory levels and forms, why it must consider the internal logic and organic character of each actor and each institutional arrangement, and why it must take into account personal motives and their evolution over time. In the future, computer-simulation will make it possible to illustrate for all actors the possible consequences of their interactions. These results are indeed often counter-intuitive, at odds with one's expectations.

George Soros published a book on this subject in 1998 entitled *The Crisis of Global Capitalism,* in which he calls attention to finance's essentially "reflexive" character.[35] Every actor acts on the basis of what he or she considers to be the reactions of everyone else. This creates built-in instability. Process approaches, decentralized regulation, and computer simulations of the emergent properties resulting from a system's countless interactions thus create fascinating possibilities of oeconomic modeling.

5. Relationships between Human Beings and Nature: A Challenge for Governance and Oeconomy

In part one, I referred to the threefold crisis of the contemporary experience of relationships: between human beings, between societies, and between humanity and nature. I

[34] Eric D. Beinhocker, *The Origin of Wealth*, Harvard Business Press, 2007.
[35] George Soros, *The Crisis of global capitalism*, Publics Affairs. 1998.

also pointed out, earlier in this chapter, that the "art of managing relationships" is one of governance's four dimensions, and that our current economy, by reducing relationships into transactions and by making a dogma out of separation, has alienated us from the art of governance.

I would now like to reconsider relationships from a broader perspective.

Governance's primary goal is to "make society": in other words, to transform an aggregate of potentially antagonistic individuals into an organized society in which people cooperate peacefully. From Aristotle, for whom man is essentially a *zoon politikon* (a "political animal") who could not exist outside the *polis* (society), to Hobbes, for whom the political order is a social pact into which men terrified by the prospect of anarchy enter on the basis of rational calculations, political philosophers have argued that governance's primary task is to construct a social order. This is a task that oeconomy, as a branch of governance, cannot avoid. Production and trade help create social bonds. Trade is more than trade: it is constitutive of the social order as such. Trade, as those who link it to peace understand, is one of the major bonds formed between human beings. For oeconomy, war and peace, competition for rare resources, and mutually beneficial cooperation are thus intimately connected.

Economic progress is often described as the gradual shift from producing and consuming for oneself to the development of mutually advantageous trade, in which everyone produces that which they produce best. Herders in the mountains trade with farmers on the plain; towns trade with the countryside. Trade is based on competitive advantage, which at times consists in nothing more than climactic properties. Ricardo made this point in his analysis of why the English make cloth and the French produce wine. But mutually beneficial trade is also the result of cooperation: people produce better together than on their own. The division of labor does not

simply depend on the mobilization of each individual's personal abilities. It also relies on group organization. Comparative advantage and cooperation are both constitutive of social existence.[36]

Oeconomy must constantly be evaluated from the standpoint of two criteria. One is technical, the other social. The technical criterion measures the extent to which trade and collective production are a positive sum game, in which everyone gains more than they would have if no exchange took place. The social criterion describes the bonds that exchange creates and preserves. Such bonds are the basis of communal life. But for bonds to play this role, they can't be anonymous. Bonds connect people. They have names. As soon as trade is a bond, the very idea of anonymous merchandise becomes as absurd and degrading as the idea of being cared for by a robot or getting one's hair cut by an automat. But machines create protective screens. It is easier to turn off a TV than to conclude a conversation. Unfortunately, it is not through the mediation of machines or merchandise that one creates a viable society. Hence the importance of traceability. What human labor—I was tempted to say human faces—lies behind the fact that I can eat, keep warm, and take advantage of progress's advantages? The idea that goods and services could be fully traceable once seemed unrealistic. Today, computers make traceability perfectly possible—as long as we want it.

The fair and equitable trade movement is a consequence of these ideas. It sees each act of consumption as the materialization of a bond. It wants to be informed (and this is the very definition of responsibility) about this bond's direct or indirect impact, the living and labor conditions in which the good was produced, and the effects that this product (which exists only because we consume it) has on these conditions. Traceability inserts each of us in a vast network of interdependence, extending from our neighbors to the planet as a whole. People who want to

[36] See, for example, the parallels that Eric D. Beinhocker draws between "physical technology" and "social technology" in *The Origins of Wealth, op. cit.*

know who produced (and under what circumstances) the bananas they buy at the store are expressing this demand. They reject the schizophrenic attitude that pays lip service to solidarity while consuming irresponsibly. Consumption—i.e., the recognition of other people's usefulness—is one side of the bond, while production is the other.

In the West, we have inherited a contradictory attitude towards work. On the hand, it is viewed as a curse. Expelling him from the Garden of Eden, god says to Adam: "By the sweat of your brow will you have food to eat until you return to the ground." This curse underpinned the tripartite organization of Indo-European society: there are those who pray, those who fight, and those who work. The order is significant: laborers are placed at the bottom. This kind of relationship between those who do not work and those who do continued until the French Revolution. For a noble, labor was derogation—i.e., loss of one's superior social status. Cross- and sword-bearers dared not breed with hoe-bearers. For Adam Smith, the capitalist's task was to make capital fruitful (notice, by the way, the nature metaphor), rather than to put it to work through productive labor. The first industrial revolution dug a ditch between bourgeois entrepreneurs and the workers—a ditch, incidentally, that is not nearly as deep as the one between contemporary corporate managers and their subcontractors half-way around the world. This ditch is the modern form of the old labor curse: the capitalist profits from the sweat of the worker, who is forced by necessity and poverty to sell his labor to the highest bidder. But is work really a curse? Of course not! For most of us, work is the main conduit by which we are integrated into society. Through work, we not only acquire financial independence, but also status and social connections. How difficult it would be to invent anew each day our reasons for living! We can see negative proof for this in new forms of social exclusion: new technology creates, perhaps, a society in which the rich no longer need the poor. Exploitation of man by man

was still a kind of relationship. But if one man becomes useless to another, the bond is broken. The major problem with long-term unemployment (at least when it is not voluntary unemployment leading to activity of a new kind) is its disaffiliating effect.

Production and consumption must thus be placed on the same level: rather than opposites, they must be seen as different perspectives on the same bond. The model of integration based on consumption has become depleted. Our place in the world depends on a balance between what we give and take—not simply on what we take.

It is not enough for trade to be mutually beneficial. It must also be fair. In some games, the fair distribution of prize money is more important than the total value of the winnings themselves. This is what the tenants of neoclassical economics have difficulty understanding. They see the Pareto optimal (i.e., the impossibility of increasing one person's satisfaction without decreasing another's) as absolute. They believe satisfaction can be measured in absolute terms—as if everyone could keep their eyes focused on their own plate, without peaking at their neighbors'. But we are social beings. Comparing ourselves to others is central to our identity and self-worth. Moreover, it is because we are social beings that there is no longer any relationship between gross national product and well-being. It is said, for instance, that economic globalization has lessened poverty. This is objectively true. But the fact that frustrations with the unequal distribution of the fruits of growth are increasing and that modern information systems make them increasingly visible is also objectively true.

Recognizing that production and trade are also bonds allows us to transform a more or less anonymous act—the exchange of money against goods available on markets—into a relation based on agreement or even on a social contract. This is what distributors or the owners of brand-names mean when, referring to their clients, they speak of a "contract of trust." ISO norms and

labels are a form of contractual guarantee. Exchange always more or less implicitly depends on a contract. One way to expand oeconomy's range is to imagine new kinds of agreements that could articulate explicitly these implicit contractual bonds.

The bonds upon which exchange is based also shape the relationship between human beings and nature. The three crises in relationships—between humans, between societies, and between human and the biosphere—are all related. Science's unremitting instrumentalization of nature, in the name of "laying bare its most intimate secrets," results sooner or later in the instrumentalization of human beings. Guaranteeing the traceability of food products and giving priority to local producers over products from half-way around the world express a deep consciousness of our relationship with the biosphere as a whole. I belong to a generation for which bread is symbolic for two reasons: it belongs to the Christian communion, but it also represents the unity of man and nature.

From the perspective of the bonds that societies create between their members and with nature, the consumption of human labor and the consumption of natural resources are thus very analogous. Still, they differ in a fundamental way. Human labor, into which a significant amount of intangible capital is incorporated, is in many ways unlimited: it is calculated not through labor hours but through productivity, which can grow almost ad infinitum. Our relationship with nature is entirely different. The biosphere's resources are finite. Where human labor always reveals the usefulness of our fellow human beings, the use of natural resources can be to their detriment (as when we collectively consume resources beyond their natural ability to regenerate). It is for this reason that our existing conception of currency is hopelessly out of date: it makes no difference and measures in the same way two components of goods and services—human labor and natural resources—that are literally incommensurable. A frugal lifestyle means something

very different when one eliminates one's dependence on other people (which amounts to denying their usefulness) than when one limits what one "takes" from the biosphere. Frugality in relation to others tears apart the social bond—a little like Onan from the Book of Genesis, who refused to share his offspring with his brother in order to keep the whole inheritance for himself. Frugality in relation to nature, however, is a perfect expression of the duty of sharing nature's riches with others.

6. Oeconomy Combines Several Types of Capital

To function, society needs both capital, which has often been accumulated over centuries or even millennia, and resources that are consumed in the production process. The latter include natural resources as well as human activity.

One learns this distinction in introductory economics classes, in which economic development is presented as a process whereby labor is gradually replaced by capital, which makes productivity gains permanent. But exactly what kind of capital are we speaking about? We have just seen that the two components of the production process, human labor and natural resources, are incommensurable. What are the implications for capital?

Here, too, the kneejerk recourse to monetary values is misleading. Consider a company's balance sheet. Assets consist of buildings, machines, stocks, patents, and (more recently) software. Liabilities indicate who the owners and creditors of these assets are.

But does an accountant's perspective really explain what labor productivity depends on? Does seeking a single monetary equivalent for one's assets or the specific owners of liabilities reflect reality or hide it? This is what I would now like to clarify.

Economic theorists, whether classical or Marxist, described the first industrial revolution primarily in terms of a substitution of labor for capital. “Production functions” generally refer to the possible ways in which these factors could be combined. It is further presumed that these factors can be reduced to capital measured in terms of the amount of money invested and labor described in terms of number of hours worked and aggregate salaries. But this account of the substitution of labor for capital is unequal to the task of explaining a modern economy or understanding the history of economic development. Rather, this history consists of a series of substitutions of one production factor by another.

The first major substitutions involved energy. Human effort was first replaced by animal and then by hydraulic power. It might be said that money is needed to buy a horse or an ox or to build a mill, and that this is a form of capital. I disagree. For the next stage was the substitution of local energy—whether human, animal, or hydraulic—by energy brought in from increasingly far away (particularly fossil energy). But the latter is not intellectual or tangible capital: it is extracted from nature. Natural capital can be enriched or be depleted and these trends, like the improvement or degradation of the soil’s fertility, determine the possibilities for future production. Natural capital and human capital are thus also incommensurable.

More detail is required. We must conceive of the production process as a combination of seven factors. There are four kinds of capital: tangible, human, intangible, and natural. Then there are three kinds of resources: human labor, raw materials, and information.

For now, I’ll consider the four kinds of capital and their different permutations.

The first, tangible capital, consists of both public goods (infrastructures, schools, hospitals) and private goods (buildings and machines).

The second, intangible capital, consists of a reservoir of knowledge and know-how which has been gradually accumulated and may be put to use at any moment. Intangible capital is also composed of both public and private capital. Patents and licenses are examples of private intangible capital, and of what we call intellectual property. The recognition by the American judicial system of intangible assets in corporate balance sheets led (as we have seen) in the seventies to a radical shift in the access of companies owning intellectual property to financial markets. By the mid-eighties, corporate investments in intangible capital were on par with tangible investments.[37] The significance of this change, which entailed an historic break in the history of production processes, is often underappreciated. But most of intellectual property does not consist of patents. Rather, it consists of information networks and corporate organization models that are not listed in balance sheets, yet which nonetheless have a decisive impact on corporate efficiency.

The conflation of tangible and intangible capital rests on a semantic error. It is based on the premise that both involve investments, i.e., renouncing immediate gratification in the hope of future gratification. However, the ways in which they are duplicated, reproduced, and maintained are extremely different.

One of the most striking examples of one production factor replacing another was substitution, in the final decades of the twentieth century, of tangible capital by intangible capital. Public intangible capital includes governance, the modalities of cooperation between actors, the normative system, and the very principles of social organization itself, all of which are irreducible to the knowledge and know-how of individuals or isolated organizations.

The third kind is human capital. I distinguish it from intangible capital because it obeys a different rationality. Human capital is the sum of knowledge and know-how possessed by the

[37] Loïc Bouvard, Pierre Calame, *Le dialogue des entreprises et du territoire*, Éd. Charles Léopold Mayer, 1988.

members of a society. These days no company, however great its size, can assume responsibility for all the investments in time and money needed to create the human capital that it needs. The qualifications companies need are no longer "tricks of the trade," which cannot be transposed onto other professions. Rather, today's companies draw from a pool of general skills, upon which most economic activities also draw: management, financial services, human resource services, logistics, marketing, project management, information technology, regulatory systems, quality control, and many others. The human capital required to run a company belongs to the employees, particularly skilled employees, rather than to the company itself. In such circumstances, massive investment in mobile human capital is, for any given company, an enormous risk, unless it occupies a dominant position on the labor market. Furthermore, human capital is built over time: needless to say, companies cannot start training children in nursery school in order to acquire, twenty years down the road, skills that by then will have long since become outdated. It follows that human capital is primarily produced in socialized circumstances. Moreover, while many people move from one company to another, far fewer move from one region or one country to another, unless necessity forces them to. This is why human capital, even it only manifests itself in the form of individual skills, remains rooted (in terms of its production as well as of its usage) in territories or nations. Recall Martin Wolf's observation about the non-incompatibility between economic globalization and higher taxes in north Europe: it is not so much payroll taxes that are competing with one another as different degrees and different means for mobilizing and reproducing human capital.

Half-way between intangible capital and human capital I place those two peculiar resources that are the ability to cooperate and normalization. Intangible capital and human capital are not confined within companies' boundaries. They are equally decisive in organization

relations between actors and what I have called institutional arrangements. At the risk of getting ahead of myself, let us consider two examples discussed by Suren Erkman: industrial symbiosis and "functional economy." Industrial symbiosis consists in the art of finding ways in which different companies physically overlap. Functional economies are able to scale back maintenance services and the renewal of existing plant through the art of creating interchangeable norms between the components of their products and plant. The habit of cooperating on a territorial scale is another form of intangible capital.

The fourth kind is natural capital. It consists in the capacity of ecosystems to adapt and regenerate. There are two dimensions to the relationship between humanity and the biosphere: the quality of the ecosystem and the flow of "withdrawals" made from the biosphere's resources. Natural capital includes the following elements: soil fertility, the quality and abundance of underground water, oceanic conditions, climate stability, rainfall rates, and the preservation of "biotas" (i.e., extensive green space, which is essential to the biosphere's stability[38]). Once again, this capital's preservation depends on a combination of public and privation initiatives.

Consideration of the four categories of capital that are necessary for production proves that we have entered a new historical era, in which intangible, human, and natural capital is as important as tangible capital. It shows, too, how these four categories always intertwine, albeit in different proportions, public and private investments: oeconomy is mixed, not by choice, but by nature.

Oeconomy relies on a formidable deployment of natural, intangible, human, and tangible capital. Actors, institutional arrangements, processes, rules, and everything we have been calling "governance" are integral to this capital. This profound truth is confirmed by the fact that after a war that completely devastated industrial plant and public infrastructures—namely, defeated

[38] On this subject, see the work by Gorshkov mentioned above.

Germany's tangible capital—productive capacity was rebuilt with astonishing speed. This reconstruction was dubbed the "German miracle." But, as is always the case in the matters, there was no miracle at all. It was called a miracle because the deeper mechanisms of development were poorly understood. Attention was focused on tangible capital, whereas capital's most essential components are intangible. This tendency to underestimate intangible, human, and natural capital also prevents us from measuring our planet's real condition. We have systems of national accounting, but they are designed primarily to measure material flows, without taking into consideration the degradation of natural capital. In the case of agriculture, for instance, we are able to count quintals of wheat and tons of sugar beets, but not the depletion of soils through loss of organic matter or over-compacting. Even less are we able to measure the loss of biodiversity.

As for intangible capital, we have an intuitive sense of its importance yet we have never devised the means to measure it. Take a simple example: the value of diasporas. One of the major forces driving China and India today is the extent of their diasporas. Because of their members' faithfulness to the homeland, a diaspora community is a formidable system for sorting, filtering, and disseminating information that allows it, like a plant's nourishing roots, to draw from the entire world everything that it needs to develop.

The human development indicators devised by the United National Development Program (UNDP) are a first step towards a system for assessing human capital. The concept of an "ecological debt" is also an attempt to assess threats to natural capital. The fact that, for over a century and a half, rich countries have employed the world's natural and fossil energy resources to their advantage must be factored into the planet's accounts to the same degree as the financial

debt of poor countries. The creation of consolidated accounts, first in each major region, and then between major regions, will help put the world right side up.