

"We are all stewards of the earth, but often lack specific information and advice on what we can do personally and collectively. *Right Relationship* provides a wonderful guide for all of us."

—President Jimmy Carter

Right Relationship

Building a Whole Earth Economy



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an excerpt from

***Right Relationship:
Building a Whole Earth Economy***

by Peter G. Brown and Geoffrey Garver
Published by Berrett-Koehler Publishers

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Foreword

Thomas E. Lovejoy

IT IS NO SECRET that the state of the global environment is extremely worrisome and getting worse literally daily. The world is headed for massive impairment of natural systems and soaring extinction rates, with global biogeochemistry already seriously out of balance. This is so despite many efforts to safeguard and restore the environment. Indeed, working on the environmental agenda can seem tantamount to running up a down escalator.

So if ever there was a time to consider the right relationship of humanity and the environment, both in the general sense of the phrase as well as in the important sense of the Quaker tradition, it is now. This book could not be timelier.

The heart of the problem, in many senses, lies at the intersection of economics and ecology. Both words, as has been often pointed out, come from the same root, namely the Greek *oikos*, meaning *house*. Yet despite the best efforts of some very good economists and ecologists the two disciplines remain far apart without even a common vocabulary, and this lack of integration is a major factor in the downward spiral of the global environment.

One problem is the way neoclassical economics attempts to bridge the gap by recognizing externalities, namely those things not accurately reflected in market prices. For example, important efforts such as work on the pricing of environmental goods and services, gets us away from the idea that nature is free for the taking. That probably was fine for our australopithecine ancestors, but with our swelling population and prowess at commandeering resources the end is already in sight. It is not possible for the current population to live a developed world lifestyle, nor is it possible for all of us to live

as hunter-gatherers. We will need to be more creative than simply getting all the prices right in fitting the economy to a finite planet. In this quest, prices surely have a role to play. A practical example is the market created to reduce the contribution to acid rain by the sulfur in power plant emissions. Current discussions about raising the price of carbon are headed in a similar direction by giving us incentives to live within the earth's biophysical limits.

A second obstacle is the concept of substitution, that is, when one resource is exhausted it can be replaced by another, as whale oil was replaced by fossil fuels. As biologists, we know by definition that one species can never completely substitute for another, even when their roles in ecosystems might be fairly similar. Even if two had identical roles, one is not expendable; our own bodies tell us that redundancy has value, which is why, for example, we have two kidneys. Would we want to have an ecosystem or planet with the equivalent of a single vital organ?

A third great challenge is the application of discount rates that basically make it easier to put off addressing problems unless their immediate costs to humanity are so great as to warrant up-front expenditure. Interestingly, Sir Nicholas Stern decided not to apply discount rates in his economic analysis of the challenge of climate change, because otherwise society's response would be too little, too late.

If, as has been pointed out, the economy is the wholly owned subsidiary of the biosphere, there needs to be a way for human action and the economy to transcend the obstacles and move humanity toward a sustainable, respectful course.

First, we need to recognize that we benefit both directly and indirectly from the environment and in ways complex and hard to measure. Huge and regular benefits will frequently accrue to humanity through advances in the life sciences from new insights based on what was previously an esoteric organism. Human societies value knowledge and libraries, but we have yet to transfer that ap-

proach to the enormously valuable living library of the life sciences represented by the diversity of life on earth. Until we do, soaring extinction rates make book burning, and the attendant ignorance, look pale in comparison.

Second, we need to think carefully about what we mean by “growth.” I have often wondered about possible lessons embedded in ecology that could be of use in developing more-sustainable economies. Biological systems have two forms of growth. In the more obvious one, the organism simply gets bigger through consuming more resources; sometimes that ceases at adulthood, but in others, like alligators, with indeterminate growth, the organism simply grows larger until it reaches the end of its life. In the second, known as growth by intussusception, the organism does not grow larger but becomes more complex. Although the analogies in economic growth may rarely be so distinct, surely the information industry has a large element of complexity, as contrasted to natural resource use.

Clearly the time is at hand—indeed, it is overdue—for a grand reconciliation between humans, human systems, and the environment. This very solid and thoughtful book sets the stage for just that, and we all are much indebted to the authors and those who labored in the Moral Economy Project.

Only a call to our higher values and their integration into our socioeconomic system can achieve what is needed. That may seem like a vainly grand ambition, but in many senses we have no other choice.

Belief in a higher being is widespread in human societies. There could be no higher calling than to recognize that our incredible living planet and humanity’s future are inextricably intertwined. I cannot but believe that as a species able to produce soaring achievements in the arts and science we have the capability to achieve right relationship.

Introduction

Moving from Wrong to Right Relationship

“BEARING WITNESS” IS THE Quaker term for living life in a way that reflects fundamental truths. Bearing witness is about getting relationships right. The group of Quakers in the eighteenth century who built a movement to end slavery were bearing witness to the truth that slavery was wrong. Yet bearing witness to right relationships is not limited to Quakers. It is something done by inspired people of all faiths and cultures when they live life according to cherished values built on caring for other people and being stewards of the earth’s gifts. The mass movement to end apartheid in South Africa, Rachel Carson’s triggering of the environmental movement in the 1960s, and the campaign of Mothers Against Drunk Driving to make roads safer are just a few examples of people coming together to bear witness to what they knew was right.

The global economy today is overwhelming the ability of the earth to maintain life’s abundance. We are getting something terribly wrong. At this critical time in history, we need to reorient ourselves in how we relate to each other and to the earth’s wonders through the economy. We need a new mass movement that bears witness to a right way of living on our finite, life-giving planet.

Right Relationship

Over just the last two decades, science has radically altered its view of the arrangement both of life and of nonliving components

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of the earth. New understandings are emerging that place relationship at the center. Biology and physics are moving away from a “reductionist” view of function, in which the activity of a living cell or an ecosystem, for example, is explained by being reduced to its parts, rather than including the relationship between those parts as essential to our understanding. Today scientists are admitting that this three-hundred-year-old scientific doctrine is far too simplistic, and are finding that physical substances work and exist in terms of highly complex, interdependent, and changeable *contexts* and *relationships*. So, for example, the relationships between genes in the human body, rather than only their individual functions, are the key to the countless ways that human genes can produce genetic traits and characteristics. We are now learning that relationship is the key to the survival of our species on the social and political level, as well. This book, then, is about relationship writ large, and about how to move to right relationship from wrong relationship in our individual and collective economic lives.

A quick story of one set of relationships operating on our planet helps illustrate this more sophisticated scientific understanding. In its natural state, oil, created over eons from organic matter by volcanic heat and compression, is found almost entirely within the earth’s crust; that is its *natural relationship* with the planet. By the same token, most forms of life can only exist within the biosphere; the thin membrane of plants, animals, and microorganisms and their life support systems at or near the earth’s surface constitutes habitat for virtually all life. Life on earth also exists in a *spatial relationship* to the atmosphere, which must contain gases also arranged in a particular relationship—not too much carbon dioxide, plenty of nitrogen and oxygen, only minute amounts of other gases. Finally, all life forms need access to a highly particular relationship between only two simple and very plentiful gases: hydrogen and oxygen. Water, so necessary to life, is in fact a relationship between those two gases. It is also found primarily on top of the earth’s crust or only a short distance beneath it or in the atmosphere above it.

These relationships can equally easily be discerned to be “wrong” if the spatial configuration of each component is seriously disturbed, just as a gene sequence cannot express itself if it does not have the necessary position in the genome and the necessary relationship with certain proteins.

Right now, one of the largest industrial projects in the planet’s history is located in western Canada. Development of the Alberta tar sands is a massive attempt to alter the relationships of the substances normally found below the earth with those on it. In this case, oil is brought from beneath the crust along with the sand it permeates and placed in relationship to the ecosystems found on the surface: forests, rivers, wetlands, and lakes. Once on the surface, the oil enters into a relatively permanent set of new relationships with air and water, both in Alberta where it is mined, and also when it is used in vehicles and heating plants in the chain of refineries and users that spread out from it, as far west as China and as far south as Texas. The immense Athabaska River, adapted over millennia and nourishing the boreal forest, enters into a long-term new set of relationships, too. To flush oil from the sands, the river is drained, boiled, forced through the oil-drenched sands, and then deposited in enormous tailing ponds, where the oil’s poisonous hydrocarbons are supposed to “settle.” The life-giving water of the Athabaska is removed from any use by life forms ever again, barring the discovery of some new, extraordinary technology.

This alteration of relationships transforms the thousands of square miles devoted to tar sands development into a huge, toxic graveyard of former life, with a stench of sulfur and hot asphalt that can be smelled from far away. The surface of the earth is stripped of all animal or plant habitat. In the surrounding area, pus-filled boils, cancers, and other lethal diseases and birth defects in the fish, animal, and human population are now being documented.¹ But not only are ecological relationships affected. Tar sands development also affects social relationships among people. Tens of thousands of workers have migrated to the few towns and many work camps on

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the site. The crime rate in the towns and cities most affected, Fort McMurray and Fort Chipewyan, and Edmonton and Calgary, has risen, as have homelessness, the cost of living, and prostitution. Human casualties from drug use, alcohol, highway accidents, and the rigors of shift work on a frontier are also escalating.

And these are only the impacts at the beginning of the chain. Once shipped from Alberta, tar sands oil will power air conditioners in deserts, furnaces in the Arctic, and many cars, trucks, and jets. It will serve as the raw material for a vast array of synthetic chemicals and fertilizers. This single industrial project even affects Canada's international relationships, as it makes the nation's compliance with emissions reductions in the Kyoto Protocol virtually impossible. Demand for Alberta's oil will be driven by an international economy that is racing ahead in pursuit of endless growth and wealth accumulation.

Alberta tar sands development, along with many other modern industrial developments such as the Three Gorges dam in China or even the war in Iraq, are clear examples of "wrong relationship."

In this book we expand the term "right relationship" from its early Quaker use to give it a more universal meaning that includes contemporary science and has roots in diverse cultural and religious traditions. Right relationship provides a guiding ethic for people wishing to lead fulfilling lives as creative and integrated participants in human society and the commonwealth of life as a whole. It is akin to what some would call "sustainability," though it goes much deeper. Right relationship offers a guidance system for functioning in harmony with scientific reality and enduring ethical traditions.

In the 1940s, conservation biologist Aldo Leopold, reflecting on what he had come to see as the next stage in human moral development, created a useful definition of right relationship. When working out what he called the land ethic, he explained that "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."² Many volumes have since been written on the philosophy of ecology, but

this simple statement has become the touchstone of the ecological worldview. Leopold's ethic gains strength when enhanced with affirmations of the inherent value of human and other life, as exemplified in Albert Schweitzer's powerful idea of "reverence for life."³

Replacing the term "stability" with "resilience" reflects the current scientific understanding of relationships. Leopold's ethic applies, as well, to the integrity, resilience, and beauty of human communities. How the ethic is understood in practice depends, of course, on the type of community. Hence, with only one alteration, his ethic becomes a practical guide for differentiating between right and wrong relationship both in human society and in the entire community of life of which humans are a part: "A thing is right when it tends to preserve the integrity, resilience, and beauty of the commonwealth of life. It is wrong when it tends otherwise."

It is quite possible to choose right relationships and the common good. Many individuals are already doing so, as are many communities and a few societies. The problem the world is currently facing, however, is that in most of our modern societies the majority

A thing is right when it tends to preserve the integrity, resilience, and beauty of the commonwealth of life. It is wrong when it tends otherwise.

of people are actively urged, even forced, to choose wrong relationships, such as those typified by the Alberta tar sands project. Greed and the constant stimulation of new desires that feed it, until quite recently regarded in most societies as sinful or at least unpleasant, have increasingly become acceptable, even glorified. Simultaneously, modern industrial activity has embraced a pathological gigantism, increasing corporate consolidations and ruthlessly crushing the small-business players, as well as the natural systems on which all economic activity depends.

In short, a pursuit of wrong relationships is the prevailing trend of our times. The signs are now well known: climate change, overpopulation, loss of topsoil and fresh water, increasing rates of spe-

cies extinction, deforestation, imperiled coral reefs, unstoppable invasive species, toxic chemicals that remain for eons in the environment, persistent human poverty and hunger, and an increasingly inflated, unstable world financial system and globalizing economy. And we only begin the list.

Right relationship with life and the world is both a personal and a collective choice, but it is a choice that we must make. It can support and inspire people struggling to find a foundational base for the development of productive societies and a healthy human–earth relationship. Opting for healthy human and ecological communities is a decision we can make that will require us to find new ways to live and to run our economies. Of course, “right relationship” is simply another way of expressing similar precepts found in many of the world’s religious and spiritual traditions. The reductionist science of the eighteenth and nineteenth centuries transformed ethical ideas by removing, for many people, their theological foundations. Now, the relationship science of the late twentieth and twenty-first centuries is beginning to change human perceptions of reality, particularly in terms of human duties to the other life forms with which we share life’s prospect.

The Commonwealth of Life

To move from wrong to right relationship, we need to answer the question: related to what? To answer this question we have chosen a term that stresses interdependence—commonwealth. It is typically used to describe a political community established to promote the *common* good, rather than only the interests of individuals or a particular class of people. Political commonwealths derive from the roots of the word: “common” and “wealth”—that is, wealth is seen as something to be allocated equitably in society, to be shared in common.

The traditional idea of a commonwealth stresses the shared features of the community and interdependence of its members. For

people, relationships with other humans or with natural communities bring in notions of mutual respect and fairness that are reflected, for example, in universally recognized moral principles like the Golden Rule. The commonwealth of life extends these notions of common features, fair sharing, and interdependence to the entire community of living beings on the earth. The “common wealth” in this community of life on the earth is now clearly the evolutionary heritage and destiny that people share with other life forms. A whole earth economy works for *all* of life’s commonwealth. Hence the subtitle of this book.

Nearly all life on the earth has been made possible by the power of the sun, which over eons has fueled the creation of living structures of increasing complexity and interdependence. These range from single-cell organisms to elephant, honeybee, or human societies, as well as the intertwined communities of plants, animals, insects, and other biota that constitute a forest. In the commonwealth of all life, the actions of each individual member or species affect the entire commonwealth, however small the result might be. We human beings are now in a position to have far greater impact on the commonwealth of life than most of the other life forms with which we share the planet. Therefore we have the responsibility and privilege to consider other beings and ecosystems when we engage in any sort of social action, including an economy. Our actions must embody an ethic of appreciating, husbanding, and sharing the earth’s bounty.

An Economy in Right Relationship

Our species has arrived at its present precarious condition through a history of development driven, in part, by economic relationships and interactions. But though it has facilitated convenience in material living over the centuries, building and maintaining human societies has often had disastrous effects on human and natural communities—the ruin of the Mayan, Roman, and Easter Island

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civilizations are examples. By objective measures, the kind of globalized economy that has seized the world since World War II is one of the most disastrous of all. Many of the earth's key life-support systems are in rapid decline.⁴ Far more catastrophic collapses are likely to hit human and ecological communities in the near future, and the long-run prospect is dire indeed unless a shift from wrong to right relationships becomes part of human culture.

The postwar financial success of a globalized economy has led to the continuing expansion of finance and consumption and to prosperity for hundreds of millions of people, but it has also trapped the nations of the world in a relentless pursuit of economic growth with no thermostat or shutoff valve. Especially since the end of the Cold War and the easing of any threat of a competing ideology, an increasingly unregulated global capitalistic economy, as developed most enthusiastically in the United States, has dismantled decades-old institutions and structures that had previously succeeded at more evenly distributing prosperity and reducing market abuses.⁵

The current system operates on the assumption that the earth's environment is a subset of the human economy, and that the earth belongs to humans. If these are the assumptions, it makes sense to transfer as much of the earth's natural capital as possible into the engines of the industrial economy. These assumptions, though, are fantastically at odds with scientific reality; human culture and its economic goals are, in pure scientific fact, a subset of the earth's environment and resources, and humanity is only one of millions of species that depend on them. Like putting water into the tar sands, placing the human economy above the well-being of the natural world creates a lethal, poisonous wrong relationship. So how can people shift from an economy based on greed and unquestioned growth to a whole earth economy that is based on right relationship with the commonwealth of life?

Five Questions in Search of Right Relationship

Five key questions, and their answers, chart a path to putting the economy in right relationship with life's commonwealth:

- What is the economy for?
- How does it work?
- How big is too big?
- What is fair?
- How should it be governed?

The balance of this introduction offers an analysis of each question, with a summary of the “wrong relationship” problem to be solved and a preview of answers based on right relationship.

Question #1: What is the economy for?

What are people aiming for, individually and collectively, in the myriad interdependent transactions that make up the economy? Most leaders in finance, business, government, and think tanks say that the global economy's purpose is to enhance human well-being by constantly maintaining economic growth. They assume, despite having little or no serious argument or data, that more consumption and economic activity will result in greater well-being.

Yet this answer makes no sense. To begin with, in mainstream economic terms, growth is not measured in terms of benefits, but simply keeps track of overall economic activity in terms of exchanges of money. Many such exchanges create negative side effects, such as pollution, but money spent on cleaning up the resulting pollution is measured as positive growth—and hence adds to dominant measures like Gross Domestic Product (GDP). So, for example, the current economic model sees the money spent cleaning up the Exxon Valdez oil spill as an increase in GDP and therefore beneficial. Similarly, when a person suffers a fatal car accident, the economic exchanges, in terms of ambulances, insurance agents, funeral homes, and so forth, increase GDP and are seen as positive.

The current purpose of the economy—providing ever-increasing wealth, with ever-increasing growth—means that cash incomes can rise while actual wealth falls, as measured by natural capital such as soil, timber, oil reserves, and clean water. Making money often demands the one-time, windfall liquidation of centuries-old natural support systems such as forests or fisheries, or even older works of nature such as the Canadian tar sands.

In addition, GDP growth contains no measure of *distribution*, so inequity, poverty, and outright starvation often can, and do, rise at the same time that overall economic activity increases.

Lastly, many studies worldwide have demonstrated that after certain basic needs are met, it is one's relative wealth—how folks compare to others, not an absolute amount of wealth accumulation—that determines much of the self-perception of happiness. In “advanced” (or, perhaps, “overdeveloped”) societies, trying to improve well-being and happiness through growth is folly on a treadmill, since people cannot all be wealthier than each other.

These problems are symptoms of an economy in wrong relationship. Right relationship, by contrast, is built, in large part, on respect for all life—the kind of respect that is inherent in the Golden Rule, fair play, and other ethical principles that people from across the world's religions and cultures learn as children. Once the economy is understood as being embedded in the living, dynamic world that surrounds it, its purposes become clear: that is, to maintain the integrity, resilience, and beauty of life's commonwealth. The human economy is our way of provisioning ourselves. Hence for humans this means providing for the well-being of individual people, households, communities, and nations. It also means providing for the health and vitality of the finite ecological community in which we live—our diverse and finite earth. Moving away from an economy based on wrong relationships does not spell economic doom. Rather, it creates opportunities for truly rich and fulfilling lives for all.

Question #2: How does the economy work?

The prevailing way of thinking about how the economy works is to imagine that the economy is the box in which social interactions, ecosystems, and their resources are contained. The current economic order has a wrong relationship with how the real economy of this planet works. First, it assumes that the earth is subsidiary to the economy. Second, it mistakes a measure of wealth—money—for wealth itself. Third, it does not know how to think intelligently about the by-products of economic activity that are not the desired outputs—what we typically call waste.

How Does the Earth Work? In a typical mainstream economics textbook, the economy is represented by a circular flow diagram. It depicts the production and consumption of goods and services without regard to the components of the earth or life's commonwealth needed to produce them. In fact, about a century ago economists stopped considering any concern for the adequacy of such resources as food and energy. Mainstream economics today proceeds, with rare exception, with no reference to the laws of physics, chemistry, or biology.

To understand how a human economy actually functions, it must be conceived of as being embedded in, and also a major determinant of, the complex systems whose relationships make up the earth's ecosphere.⁶ This requires a basic scientific understanding of how the planet works, which in turn requires some understanding of how the universe itself works. Kenneth Boulding, an economist and pioneer of complex systems, pointed out in the 1960s that the earth can be thought of as a spaceship: The material available for economic activity is limited to what is already on board the craft floating in the universe.

The fact that the earth is a system closed to matter has important implications. For all practical purposes, nothing ever enters or leaves. But the earth is open to energy. It receives a continuous flow of energy from outside the system in the form of sunlight, and it

radiates roughly the same amount of heat back into space. This flow of heat from the sun is a key factor in making life on the earth not only possible, but abundant. The energy from past sunlight is stored in coal, oil, and natural gas. These are called *stocks*. Present and future sunlight is called *flows*.⁷ Both stocks and flows of sunlight are finite, and this inescapable fact places limits on the earth's life-support capacity. Understanding this fact forms an essential foundation for building an economy in right relationship with life and our earth.

What Is Wealth? Everything on the earth gives us our wealth. We typically treat wealth as solely a matter of money. In fact, money is a human tool exchanged for the real things that make up wealth: edible plants and animals, useful objects such as containers or furniture, the land and soil that can continue to produce real wealth in the future. Valuing the symbolic value (money) higher than the real one has led to the wholesale neglect of what makes this wealth possible.

The fundamental wealth on the earth, on which all else depends, is the ability to maintain life itself, which is made possible by the ability of green plants to convert sunlight into sugars. Plant-

The fundamental wealth on the earth is the ability to maintain life itself.

based sugars are wealth. They are used by the plants themselves and by virtually all other organisms to sustain themselves and to reproduce. Without this simple activity, all the manufactured capital, all the human capital, all the social capital, all the money, all the bank deposits, and all the credit cards on the earth—the totality of these not only would be worthless, they would not exist. An economy in right relationship with real wealth is built on the simple fact that the integrity, resilience, and beauty of natural and social communities depends on the earth's vibrant but finite life-support capacity.

What Is Waste? Like symbolic wealth, waste does not exist in nature. All materials—from cow dung to lava flows—are reused or recycled for a huge variety of purposes. On the surface of the planet,

nature's "wastes" support all life. Within conventional economics, the undesired products of an economic activity are viewed as useless "waste." If they are not priced, they are viewed as external to the market. This is what is called the "theory of externalities." The basic idea is that the prices paid in a transaction often do not include all the costs of production. For example, without some kind of correction, the \$50 paid for a tire will not reflect the damage done to the lungs and laundry of people who live downwind of the plant where the tire is made. Because this unintended by-product is considered "external" to the market, it is a cost that the tire manufacturer and the consumer never pay, in an unregulated market.

Making the tire manufacturer pay for the pollution and harm it causes is an example of the "polluter pays" principle, which is extremely appealing at first glance. If you are going to cause harms, then you should pay for them. Even so, the polluter-pays principle is not an adequate solution to the pollution, toxic substance, and "waste" stream problem.

First, it is often impossible to calculate the monetary costs of pollution. How much harm will any given amount of additional carbon dioxide in the atmosphere—which speeds up global warming—cause by changing monsoon patterns in India over the next century?

Second, while the polluter-pays principle, in theory, allows a business or institution to pollute as much as it wishes as long as it is willing to pay for the pollution, there are some things that should be prohibited, rather than tolerated as long as compensation is paid. No amount of compensation will make up for a child killed or deformed by toxic chemicals in her playground.

Third, the polluter-pays principle is almost always applied in an anthropocentric way, assuming that only costs to humans matter. A deformed and dying frog population is regarded as irrelevant unless people are also affected.

The theory of externalities also fails to consider that, strictly speaking, there is no such thing as a "by-product." All results of

manufacturing and processing industries are direct products, whether they are useful or not.⁸ In a whole earth economy there is no such place as “away,” as in “throw it away.” All worn-out or cast-off products remain within the ecosystem. All economic activity is internal to the biosphere.

To fashion an economy existing in right relationship with life’s commonwealth, a big jump is needed to an entirely different conceptual framework and accounting system. Only an economy that completely outgrows the idea of “waste” can work on spaceship earth, where all products of manufacturing and other processes must be accounted for. In a whole earth economy, materials internalization would replace cost internalization: Manufacturers would be responsible for recycling as much energy and material as possible. Similarly, the notion of consumption, which implies an ending or discarding of the material consumed, must give way to a notion of *transformation* of the material into the beginning of something else. This is what is called the “waste is food” or “cradle to cradle” approach.⁹ In a whole earth economy, refusal to tolerate *any* waste has to become the goal for all economic activity.

The European Union is taking important steps in this direction. Today every car or washing machine coming off the assembly line in the EU must be recyclable. All the components must either be recycled by the earth (if benign) or reused in the industrial stream (if poisonous), thereby using the nonabsorbable heavy metals and petrochemicals again to make more machines. Legislation to this effect has been in effect for years in Germany, for example, though it still seems light-years away to North Americans. Of course, during the operation of an appliance like a washing machine, soap, bleach, and other by-products will be used and discarded—which also must be processed by the earth’s systems.

Question #3: How big is too big?

How does the earth's finiteness affect how we think about the economy? Pondering this focuses attention on the issue of whether the economy could be too big, too fast, or too intense. The current economy has no measure of "enough." It has no means of saying when growth has become what economist Herman Daly has termed "uneconomic"—when the negative effects of growth outweigh the benefits.¹⁰ An economy in right relationship with the planet has a thermostat, complete with a shutoff valve, that prevents economic growth from shutting down the very life-support systems on which the economy depends.

Understanding the question of scale starts with the fact that plants are the basic energy source from which all animals (including humans and their cultural projects) ultimately come. Plants get their energy from sunlight. The global growth economy is overly dependent on consuming sunlight from the past that is stored in fossil fuels. It shifts many of the ecological consequences of current economic activity to the future, building up carbon dioxide in the atmosphere and taking heavy metals from under the earth's surface and scattering them throughout the surface environment.

We humans can do the math; we *know* that renewable resources such as soil, forests, and fish are now being consumed at a rate faster than they can be replenished, and we know that greenhouse gases are increasing dangerously in the atmosphere. Most of us recognize that this simply does not work over the long term. An economy without a thermostat or shutoff valve—for example, having no way to make drastic cuts in greenhouse gas emissions despite an overwhelming scientific consensus that indicates not doing so will lead to catastrophic climate change—is in wrong relationship with the commonwealth of life. This means that we are still not effectively answering a simple question: How big should the economy be?

The economy's growth and size, as well as its intensity, velocity, and momentum, must be judged at every turn by its impact on the

“integrity, resilience, and beauty” of human society and ecological communities. The *momentum* of the economy is especially important to keep in mind. For example, because so many impacts of human economic activity are growing on such a massive scale, even if greenhouse gas emissions were to start decreasing immediately, and even if emissions were to equal nature’s withdrawals, it would still take decades, even centuries, for the climate to stabilize.

Measuring the scale of the economy and its impacts on social and ecological communities will require rigorous scientific inquiry and monitoring of indicators of both ecosystem and social-system health and resilience, on a global scale. In today’s economy, scientific research tends to favor profit-making pursuits. Tracking the scale of the economy will take a much greater commitment to scientific research aimed at the common good—at developing a comprehensive understanding of how key life-support systems function. New measures of societal and ecological well-being, many of which already have been proposed, will need to be refined and then substituted for current measures of economic growth—GDP, in particular.

A method of doing all these things is derived from the $I=f(PATE)$ framework, based on work by Paul Ehrlich and John Holdren.¹¹ This framework says that the human impact on the global ecosystem (I) is a function (f) of the complex interplay among population (P), affluence (A), technology (T), and ethics (E). Understanding this set of relationships provides a means for figuring out how to keep the human economy within the earth’s ecological limits.

Question #4: What’s fair?

In laying out his “spaceship earth” metaphor, Boulding pointed out that “we have a two-deck spaceship”: one deck for the haves and one for the have-nots.¹² Yet the current economic order has no measure of fairness. Its main antidote to poverty is more growth—justified by the facile slogan that “a rising tide lifts all ships.” In many countries and regions of the world, notably China and India, growth has indeed been a major factor in moving hundreds of millions out

of poverty. But in the four decades since Boulding wrote, the human population has approximately doubled. It is a sad fact that those people in the world today who are desperately poor still number in the hundreds of millions.¹³ At this point in history, we can no longer afford to try to address poverty through aggregate growth. To do so is simply unfair to future generations of humans and other species.

Determining what is fair also must take into account the enormous current and future ecological harm ranging from soil erosion and species extinction to massive destabilization of climate through greenhouse gas emissions. Hence, Boulding's vision needs to be expanded. We tend to think only about how humans should be sharing the benefits and burdens of living with *other humans*. An economy in right relationship has to include the fair sharing of the earth's life-support capacities with all of life's commonwealth. In a whole earth economy, fairness requires that we seek a flourishing earth—a world that works for all.

Question #5: How should the economy be governed?

Throughout history, humans have cooperated to establish rules that all members of a community or society are expected to follow. Even the most fervent supporters of the free market would concede that some rules are necessary. The question, then, is: what rules? How are they established and enforced? Which rules characterize our institutions today?

Under the leadership of the thirty countries of the Organisation of Economic Co-operation and Development (OECD), money and its surrogates have become more and more detached from government regulation and control. The world economic powers insist on "free trade," minimally regulated by national or international authorities. They also work to ensure that capital investment and financial markets remain minimally regulated by any publicly responsible body. This global free-for-all puts mounting pressure on social and ecological communities, which are wrongly assumed to

be adequately protected as long as global GDP continues to climb. Governments are increasingly answerable not to their electorates, but rather to the financial interests that help politicians attain positions of authority and spend vast resources to influence governance decisions.

Unfortunately, many of the current piecemeal government solutions to the combination of problems threatening the global commons often exacerbate the problem. Examples such as genetically engineering crops to increase food yields, or using biofuels to provide a renewable source of fuel, will almost certainly increase ecological and social problems. Both require enormous monocultures, machinery driven by and fertilizers derived from fossil fuels, and the use of industrial patents, which affects land use and tenure and entails huge wealth-distribution problems, as well as genetic and chemical pollution. The fundamental reason the solutions are often even more dangerous than what they replace is that they grow out of and perpetuate the insane drive of industry and government for limitless growth. They often still serve wrong relationships.

What kind of governance is required for a whole earth economy? Current international institutions lack adequate mechanisms to understand, let alone manage, the ecological limits that place limits on the economy's size; to protect global commons; to establish global ecological rules that all the world's nations and citizens must live by; and to ensure that those rules are obeyed. For this reason, new and more effective governance is urgently needed at the global level. The missing global governance functions could be established in various ways. Four global institutions can be envisioned that would put them in place: an earth reserve; some form of global federalism; global environmental trusteeships; and a mandatory world court.

A *Global Reserve* would gather and analyze information on the ecological impact of the human economy. Key elements of such information would be research, monitoring, and analysis needed to assess the economy's scale limits, allocation, and distribution. This information, built around refined indicators of the health and re-

silence of social and ecological communities, would also serve the other global institutions.

A *Global Federation*, admittedly, can seem repulsive at first glance. Yet people seldom recognize that the entire planet is already under global governance of a nondemocratic and destructive kind that undercuts life's prospects. For example, most countries have already subjected themselves to the authority of the World Trade Organization and the International Monetary Fund, which often impose disastrous choices on formerly independent and self-sufficient countries and localities. Currently, the most effective transnational institution, in terms of how it protects ecosystems and human cultures, is the European Union, though it must be disentangled from the current economic paradigm, and the ecological impact of the average European is still too high.¹⁴ It differs from other international governance organizations in that it is more democratic and relatively transparent. The new Global Federation could be modeled, in part, on the EU and given jurisdiction over the operation of a whole earth economy, but with important decentralization features that maintain local control and innovation as much as possible. This is the crucial principle of subsidiarity. One of the Global Federation's primary duties would be to design policies to ensure a fair way to share access to life's basic necessities.

Trusteeships of Earth's Commons would protect the ozone layer, the atmosphere, the oceans, and the other global commons necessary for life's flourishing, by monitoring and administering the limits and allocations deemed necessary through the work of the Global Reserve.

Finally, a *Global Court* would resolve disputes arising out of the operation of these institutions and hold them to their charters.

Such institutions as these might seem hopelessly idealistic. But what is truly unrealistic is the idea that continuing down the current economic path will ever serve the common good, or save the life forms and cultural traditions of this planet from their march toward extinction.

Four Steps to Achieving a Whole Earth Economy

Study after study has shown that reaching the goal for which we humans have placed our entire planet at risk—economic escalation and personal wealth—does not even make us happy. Above a certain amount needed to maintain a roof over their family and put food on the table each day, human beings in every country surveyed are not made happier by more material goods, even in significant amounts. What *does* make us happy are the ideals promoted by almost every ethical tradition known: belonging to a community; enjoying good health; sharing; loving and being loved; having access to nature; making a meaningful contribution. When we envision the true limitations, responsibilities, and mystery of living on the earth, we will begin to experience far more fulfilling lives than the excessive acquisition of material possessions can ever provide.

What can be done, then, to start building a whole earth economy in right relationship with life's commonwealth? The first step on this new path is *grounding and clarification*. Right relationship is based on feeling a sense of awe for the cosmos and embracing an ethic of humankind's appropriate place in, and relationship to, the cosmos and the earth. Grounding and clarification begin with the recognition that it makes much more sense to be inspired to live within the ecological limits of the earth than to ignore the ecological consequences of relentless economic growth. People everywhere need to envision having fulfilling lives, and then start living them by walking more lightly on the earth. Plenty of books, Internet resources, and community-based organizations provide creative ways to do this. With first grounding and then clarification, a whole earth economy can start to take hold.

Second, building a whole earth economy will require *development of models, pilot programs, and techniques* based on right relationship, informed by history but tailored as best they can be to the future. The global institutions envisioned in this book require

further discussion and development; perhaps other approaches will better provide the governance functions urgently needed at the global level. Whatever institutions emerge must preserve local decision making, yet ensure respect for new, ecologically based rules that we all must live by to avoid the further unraveling of life's commonwealth and the attendant decline in the human prospect. This is not something that should only be left to "experts." What will daily life be like when a new kind of global governance comes into play? The answer will depend not only on the details of how global governance functions, but also on how it makes sense in the daily lives of people in communities across the globe. The more people who participate in discussing new forms of global governance, the better it will serve people and the entire commonwealth of life fairly and effectively.

The third step is *bearing witness to a guidance system built on right relationship*. As a better future built on right relationship comes into sharper focus, a mass epiphany is bound to take place. Everyone who wants to preserve the integrity, resilience, and beauty of the commonwealth of life for future generations needs to commit to individual and collective changes that will lead to right relationship. It is impossible to predict how or when this epiphany will take place. But it is possible to hope for it and work for it by bearing active witness to the concept of right relationship and to the urgent need for change.

The last and catalytic step in this vision for building a whole earth economy is *the igniting of a social movement of nonviolent action* that changes hearts, minds, and policy toward right relationship. Quaker history contains many stirring examples of action leading to the advancement of significant social and economic reform, while the Quaker template for abolishing both the slave trade and slavery itself against powerful, entrenched interests is the most well known. The Quaker example can serve as an inspiring model for building a whole earth economy in right relationship with life's commonwealth.

this material has been excerpted from

***Right Relationship:
Building a Whole Earth Economy***

by Peter G. Brown and Geoffrey Garver

Published by Berrett-Koehler Publishers

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