SEEDS OF VIOLENCE, SEEDS OF HOPE
Exploring Economics in an Ecological Context

Volume I: The Reader

Readings and Activities for Friends' Reflection and Discernment

A Resource for the Friends Testimonies and Economics Project

Seeds of Violence, Seeds of Hope was produced by the Friends Testimonies and Economics (FTE), a joint project of the Earthcare Working Group (EWG) of Philadelphia Yearly Meeting, and Quaker Earthcare Witness (QEW). FTE was formed to raise awareness among Friends about current economic policies and institutions as they relate to Friends historic testimonies.

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INTRODUCTION

THE READER

Purposes of the Friends Testimonies and Economics Project, and *Seeds of Violence, Seeds of Hope*

"Friends do not agree on economics" was the explanation several years ago for why economic policy was largely ignored at otherwise spirited and informed discussions at an FCNL annual meeting. Furthermore, public discourse about economics tends to be polarized around labels and slogans and clouded by abstract language. Yet, as you'll discover through the articles and activities in this resource, an understanding of basic economic concepts is important to Friends efforts to promote peace, justice, and restoration of earth's ecological integrity.

The Friends Testimonies and Economics (FTE) project seeks to engage Friends in

- learning more about current economic concepts, policies, and institutions as they relate to our historic testimonies in an ecological context, and
- supporting advocacy by Friends Committee on National Legislation (FCNL) and other Friends organizations for a comprehensive reformulation of U. S. economic policy.

We see this as essential if progress is to be made toward any enduring prevention of deadly conflict.

We intend this resource to serve three related purposes:

- to help individual Friends involve themselves with the purposes of the FTE project;
- to provide activities focusing on particular themes for use in adult religious education classes, discussion groups, or other settings; and
- to offer options of activities and readings for a more extended workshop or interactive course.

Organization of this Resource

Volume I contains a series of short, accessible articles. They provide an ecological and ethical context, describe fundamental economic concepts and established analytic orientations, and suggest avenues for working toward more ecologically integrated economic practices.

Volume II provides an outline of some key points presented in Volume I and provides a variety of experientially-oriented and conceptually-oriented activities that can be use separately or in combination with one another for interactive presentations and workshops. It has been our experience that many Friends do not fully grasp the nature of exponential growth or the way most modern money is created by the banking system. "The King and the Wiseman" and "Smithville's Fabled Economic Growth" have been eye-openers for these Friends.

Volume III contains a series of articles that present particular viewpoints of individual Friends who have been involved with the FTE project, and of several others whose views seem important to include. They assume readers are familiar with the concepts and terminology presented in Volume I.

About the FTE Project

Shortly after the events of September 11, 2001, both the Earthcare Working Group of Philadelphia Yearly Meeting and Quaker Earthcare Witness, through its project on National Legislation, began to focus on economics as an essential aspect of efforts to transform the human-earth relationship. This led to co-sponsoring the Gathering on Economics and Friends Testimonies at Pendle Hill in June, 2003.

The Gathering addressed a Letter to Friends with the following quotation that provides the project's foundation. It was also the impetus for a process that has led, through many interactive presentations in a variety of settings, to the production of this Resource.

> We believe the human-earth relationship in all its aspects is inseparable from our relationship with the Divine. We are convinced that the current economic system should be of urgent concern to the Religious Society of Friends. It is intensifying economic and social inequities throughout the world, causing structural and physical violence, driving many species to extinction, and leading our own species to self-destruction. We urge all Friends to learn more about current economic policies and institutions as they relate to Friends historic testimonies, and to equip ourselves to work effectively for public policies that restore Earth's biological integrity and resilience, increase social equity, and strengthen communities.
>
> — *from a* **Letter to Friends** *by a Gathering of Friends at Pendle Hill, 2003.*

The FTE project will now focus on

- identifying and equipping a group of committed Friends to provide workshops and interactive presentations and discussions
- finding interested Friends to arrange for opportunities in monthly meetings and churches, at yearly meeting sessions, and in other settings, to engage other Friends with the purposes of the project.

We believe that those who seek to lift up concerns about economics and Friends testimonies do not need to be experts, but do have an on-going responsibility to be as informed and prepared as possible. Working toward three aspects of preparation seems essential as ongoing tasks:

- a clear understanding of basic concepts, terminology, and established analytic orientations; and an ability to explain these in clear, accessible language to those with little prior knowledge or understanding;
- an ability to identify one's own opinions and points of view, and to explain them clearly in relation to the established analytic orientations; and
- an ability to listen carefully to others' opinions and points of view, and to relate these other viewpoints to those derived from the established orientations.

If you'd like to become involved with the concern about economics and Friends testimonies, either by leading sessions or arranging for them, please contact Ed Dreby.

Seeds of Violence, Seeds of Hope

Volume I: The Reader

SECTION 1

ECOLOGICAL REALITIES AND STRUCTURAL VIOLENCE

The articles in this section provide an ecological and ethical context for exploring basic economic concepts, and describe avenues and opportunities for creating a more ecologically integrated economy.

* * *

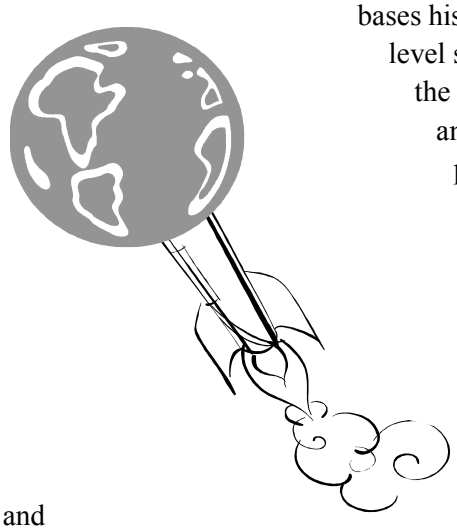
Questions at the end of each article were prepared
by David Korfhage and Margaret Mansfield

EARTH AS A SPACE SHIP

by Kenneth E. Boulding

Presentation of May 10, 1965, Washington State University, Committee on Space Sciences, from Kenneth E. Boulding Papers, Archives (Box # 38), University of Colorado at Boulder Libraries.

In the imagination of those who are sensitive to the realities of our era, the earth has become a space ship, and this, perhaps, is the most important single fact of our day. For millennia, the earth in men's minds was flat and illimitable. Today, as a result of exploration, speed, and the explosion of scientific knowledge, earth has become a tiny sphere, closed, limited, crowded, and hurtling through space to unknown destinations. This change in man's image of his home affects his behavior in many ways, and is likely to affect it much more in the future.



It is not only that man's image of the earth has changed; the reality of the world social system has changed. As long as man was small in numbers and limited in technology, he could realistically regard the earth as an infinite reservoir, an infinite source of inputs and an infinite cesspool for outputs. Today we can no longer make this assumption. Earth has become a space ship, not only in our imagination but also in the hard realities of the social, biological, and physical system in which man is enmeshed.

In what we might call the "old days," when man was small in numbers and earth was large, he could pollute it with impunity, though even then he frequently destroyed his immediate environment and had to move on to a new spot, which he then proceeded to destroy. Now man can no longer do this; he must live in the whole system, in which he must recycle his wastes and really face up to the problem of the increase in material entropy which his activities create. In a space ship there are no sewers.

Let me suggest, then, some of the consequences of earth becoming a space ship. In the first place, it is absolutely necessary for man now to develop a technology that is different from the one on which he now bases his high-level societies. High-level societies are now based on the consumption of fossil fuels and ores, none of which, at present rates of consumption, are likely to last more than a few hundred years. A stable, circular-flow high-level technology is conceivable in which we devote inputs of energy to the concentration of materials into useful form, sufficient to compensate for the diffusion of materials which takes place in their use.

At the moment we take fuels and burn them, we take concentrated deposits of iron ore for instance, and phosphates, and we spread these throughout the world in dumps, and we flush them out to the oceans in sewers. The stable high-level technology will have to rely on the oceans and the atmosphere as a basic resource from which materials may be concentrated in sufficient quantity to overcome their diffusion

through consumption. Even this, of course, will require constant inputs of energy. There is no way for the closed system to prevent the increase of entropy. Earth, fortunately, has a constant input of energy from the sun, and by the time that goes, man will probably have abandoned earth; and we have also the possibility of almost unlimited energy inputs from nuclear fusion, if we can find means of harnessing it usefully.

Man is finally going to have to face the fact that he is a biological system living in an ecological system, and that his survival power is going to depend on his developing symbiotic relationships of a closed-cycle character with all the other elements and populations of the world of ecological systems. What this means, in effect, is that all the other forms of life will have to be domesticated, even if on wildlife preserves.

The consequences of earth becoming a space ship for the social system are profound and little understood. It is clear that much human behavior and many human institutions in the past, which were appropriate to an infinite earth, are entirely inappropriate to a small, closed space ship. We cannot have cowboys and Indians, for instance, in a space ship, or even a cowboy ethic. We cannot afford unrestrained conflict, and we almost certainly cannot afford national sovereignty in an unrestricted sense.

On the other hand, we must beware of pushing the analogy too far. In a small ship, there would almost have to be a dictatorial political system with a captain, and a planned economy. A voyaging space ship, like a battleship, almost has to be a centrally planned economy. A large space ship with three billion passengers, however, or perhaps ten billion, may have a very different social structure. Large social organizations are very different from small. It may be able to have much more individual freedom, a price system and a market economy of a limited and controlled kind, and even democratic political institutions.

There must be, however, cybernetic or homeostatic mechanisms for preventing the overall variables of the social system from going beyond a certain range. There must, for instance, be machinery for controlling the total numbers of the population; there must be machinery for controlling conflict processes and for preventing perverse social dynamic processes of escalation and inflation. One of the major problems of social science is how to devise institutions which will combine this overall homeostatic control with individual freedom and mobility. I believe this problem to be not insoluble, though not yet solved.

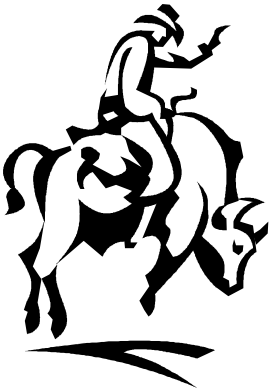
Once we begin to look at earth as a space ship, the appalling extent of our ignorance about it is almost frightening. This is true of the level of every science. We know practically nothing, for instance, about the long-run dynamics even of the physical system of the earth. We do not understand, for instance, the machinery of ice ages, the real nature of geological stability or disturbance, the incidence of volcanism and earthquakes, and we understand fantastically little about that enormously complex heat engine known as the atmosphere. We do not even know whether the activities of man are going to make the earth warm up or cool off.

At the level of the biological sciences, our ignorance is even greater. Ecology as a science has hardly moved beyond the level of bird-watching. It has yet to become quantified, and it has yet to find an adequate theory. Even to an economist, its existing theoretical structures seem fantastically naive, and when it comes to understanding the world social system or the sociosphere, we are not only ignorant but proud of our ignorance. There is no systematic method of data collection and processing, and the theory of social dynamics is still in its first infancy.

The moral of all this is that man must be made to realize that all his major problems are still unsolved, and that a very large and massive intellectual effort is still necessary to solve them. In the meantime, we are wasting our intellectual resources on insoluble problems like unilateral national defense and on low-priority achievements like putting a man on the moon. This is no way to run a space ship. ♦

Excerpt from "The Economics of the Coming Spaceship Earth"*
by Kenneth Boulding

We are now in the middle of a long process of transition in the image which man has of himself and his environment. Primitive man, and to a large extent also men of the early civilizations, imagined themselves to be living on a virtually illimitable plane. There was almost always somewhere beyond the known limits of human habitation, and over a very large part of the time that man has been on earth, there has always been something like a frontier. That is, ***there was always some place else to go when things got too difficult,*** either by reason of the deterioration of the natural environment or of the social structure in places where people happened to live.



The image of the frontier is probably one of the oldest images of mankind, and it is not surprising that we find it hard to get rid of….The closed earth of the future requires economic principles which are somewhat different from those of the open earth of the past.

For the sake of picturesqueness, I am tempted to call the open economy the ***"cowboy economy,"*** the cowboy being symbolic of the illimitable plains and also associated with ***reckless, exploitative, romantic, and violent behavior,*** which is characteristic of open societies. The closed economy of the future might similarly be called the ***"spaceman economy,"*** in which the earth has become a single spaceship, without unlimited resources of anything, either for extraction or pollution, and in which, therefore, man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy.

The difference between the two types of economies becomes most apparent in the attitudes toward consumption. ***In the cowboy economy, consumption is regarded as a good thing,*** and production likewise; and the success of the economy is measured by the amount of throughput from the "factors of production," a part of which, at any rate, is extracted from the reservoirs of raw materials and non-economic objects, and another part of which is output into the reservoirs of pollution…. By contrast**, *in the spaceman economy, throughput is by no means a desideratum, and is indeed to be regarded as something to be minimized rather than maximized…..***

In the spaceman economy, what we are primarily concerned with is stock maintenance, and any technological change which results in the maintenance of a given total stock with a lessened throughput (that is, less production and consumption) is clearly a gain. This idea that both production and consumption are bad things rather than good things is very strange to economists, who have been obsessed with income-flow concepts to the exclusion, almost, of capital-stock concepts…. ♦

* Kenneth Boulding, *Environmental Quality in a Growing Economy*, (Baltimore: The Johns Hopkins Press, 1966).

The essential measure of the success of the economy is not production or consumption at all, but the nature, extent, quality, and complexity of the total capital stock, including the state of human bodies and minds in the system.

☼ **Boulding suggests that humans have two views of the earth — one that it is empty, and one that it is full. How have you experienced the earth as "large" or "infinite"? What experiences have you had of a crowded earth where there are "no sewers"?**

☼ **How are parts of each of these views of the earth in harmony with a Quaker outlook?**

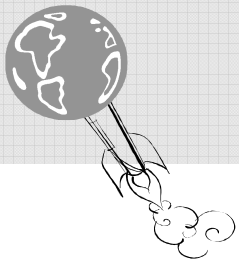
☼ **What prominent examples of the "cowboy ethic" described by Boulding do you see today? What examples of the "spaceship ethic" do you see?**

☼ **In what ways does Quakerism run counter to the cowboy ethic? To the spaceship ethic?**

☼ **Boulding says we must face the reality of living as a biological system in an ecological system. How does this fit our image of a "spaceship"? What changes does this suggest we must make in our priorities? In our testimonies? Our actions?**

☼ **Boulding implied that government must have a role in directing and controlling social and economic processes, e.g., population growth, consumption, energy use. Do you agree? How can we balance the value of freedom with the need to preserve the earth's ecosystem?**

☼ **In what ways do contemporary social values and activities reflect a change of outlook of the sort that Boulding called for 40 years ago?**
What would be most apt to promote a continuing and constructive change of outlook?



THE PRESCIENCE OF JOHN WOOLMAN AND MARTIN LUTHER KING, JR

selected with commentary by Keith Helmuth

One of the remarkable things about John Woolman is that virtually all his perceptions about spiritual disorders crossed over into their socioeconomic consequences. And all his discussions concerning social and economic behavior lead back to their spiritual foundations. Woolman also had an intuitive understanding of the integrity of life as God creates it, and the ecological disruption that accumulations of profit and privilege entail. These qualities are vividly conveyed in these excerpts from his writings:

> The sun appearing, we set forward, and as I rode over the barren hills my Meditations were on the alterations of the circumstances of the natives of this land since the coming in of the English. The lands near the sea are conveniently situated for fishing. The lands near the rivers, where the tides flow, and some above, are in many places fertile and not mountainous, while the running of the tides makes passing up and down easy with any kind of traffic. Those natives have in some places, for trifling considerations, sold their inheritance so favourably situated, and in other places have been driven back by superior force, so that in many places . . . [they] have to pass over mountains, swamps and barren deserts, where traveling is very troublesome, in bringing their skins and furs to trade with us. By the extending of English settlements and partly by English hunters, those wild beasts they chiefly depend on for a subsistence are not so plentiful as they were….
>
> My own will and desires being now very much broken and my heart with much earnestness turned to the Lord, to whom alone I looked for help in the dangers before me, I had a prospect of the English along the coast for upward of nine hundred miles where I have traveled. And the favourable situation of the English and the difficulties attending the natives in many places, and the Negroes, were open before me. And a weighty and heavenly care came over my mind, and love filled my heart toward all mankind, in which I felt a strong engagement that we might be obedient to the Lord while in tender mercies he is yet calling to us, and so attend to pure universal righteousness….
>
> And in this lonely journey I did this day greatly bewail the spreading of a wrong spirit, believing that the prosperous, convenient situation of the English requires a constant attention to divine love and wisdom, to guide and support us in a way answerable to the will of that good gracious, and almighty Being who hath an equal regard to all mankind. And here luxury and covetousness, with numerous oppressions and other evils attending them, appeared very afflicting to me, and I felt in that which is immutable that the seeds of great calamity and desolation are sown and growing fast on this continent. Nor have I words sufficient to set forth that longing I then felt that we who are placed along the coast, and have tasted the love and goodness of God, might arise in his strength and like faithful messengers labour to check the growth of these seeds, that they may not ripen to the ruin of our posterity.[1]

Today instead of picturing just 900 miles of the Atlantic coast and a hundred or so miles inland, we must picture the whole earth, the relationships between rich and poor, and between land, resources, and human settlements. Woolman understood that the financial system depends on the production system, which de-

pends on the earth's ecosystems; and he saw the tendency in human economic behavior to have these fundamental dependencies exactly the wrong way around: the financial system driving the production system, and affecting ecosystems without regard for their integrity or sustainability.

Wealth desired for its own sake obstructs the increase of virtue, and large possessions in the hands of selfish men have a bad tendency, for by their means too small a number of people are employed in things useful; and therefore they, or some of them, are necessitated to labour too hard, while others would want business to earn their bread were not employment's invented which, having no real use, serve only to please the vain mind.

Rents set on lands are often so high that persons who have but small substance are straightened in hiring a plantation; and while tenants are healthy and prosperous in business, they often find occasion to labour harder than was intended by our gracious Creator. Oxen and horses are often seen to work when, through heat and too much labour, their eyes and the emotion of their bodies manifest that they are oppressed…. Many poor people are so thronged in their business that it is difficult for them to provide shelter suitable for their animals in great storms.[2]

If Interest were lower, grain lower and kept more plentiful in our Country, wages of hired men might with reason be lower also. Hence encouragement would naturally arise to husbandmen, to raise more Sheep and flax, and prepare means to employ many more poor people amongst us.

The high interest of money which lieth on many husbandmen is often a means of their struggling for present profit…. I have known landholders who paid interest for large sums of money, and being intent on paying their debts by raising grain [and by sending abroad great quantities of grain], have by too much tilling, so robbed the earth of its natural fatness, that the produce thereof hath grown light [and the fatness of our land diminished].[3]

On April 4, 1967, one year before he was assassinated, Martin Luther King, Jr. spoke at Riverside Church in New York City. After detailing his opposition to the Vietnam War, King addressed general questions of U.S. foreign policy. In this context he began to organize the Poor People's Campaign for a march on Washington to dramatize the links among racism, civil rights, militarism, and economic justice, and to address the world-wide issue of poverty. His words resonate with even more power today than in 1967.

The war in Vietnam is but a symptom of a far deeper malady within the American spirit, and if we ignore this sobering reality... (the) words of the late John F. Kennedy come back to haunt us. Five years ago he said, "Those who make peaceful revolution impossible will make violent revolution inevitable."

Increasingly, by choice or by accident, this is the role our nation has taken — the role of those who make peaceful revolution impossible by refusing to give up the privileges and the pleasures that come from the immense profits of overseas investment. I am convinced that if we are to get on the right side of the world revolution, we as a nation must undergo a radical revolution of values. We must rapidly begin the shift from a "thing-oriented" society to a "person-oriented" society. When machines and computers, profit motives and property rights are considered more important than people, the giant triplets of

racism, materialism, and militarism are incapable of being conquered....

The Western arrogance of feeling that it has everything to teach others and nothing to learn from them is not just. A true revolution of values will lay hands on the world order and say of war: "This way of settling differences is not just." This business of burning human beings with napalm, of filling our nation's homes with orphans and widows, of injecting poisonous drugs of hate into veins of people normally humane, of sending men home from dark and bloody battlefields physically handicapped and psychologically deranged, cannot be reconciled with wisdom, justice and love. A nation that continues year after year to spend more money on military defense than on programs of social uplift is approaching spiritual death.

The time has come for an all-out war on poverty…. The first step…is passionate commitment. All wealthy nations must see it as a moral obligation…with humility and penitence and the sober realization that everything will not always go "our way." It cannot be forgotten that the western powers were but yesterday the colonial masters….

The West must also understand that its economic growth took place under rather propitious circumstances…. Most young governments of the world today come into being without these advantages, and above all, they confront staggering problems of over-population. There is no possible way for them to make it without aid and assistance…. A genuine program on the part of the wealthy nations to make prosperity a reality for the poor nations will in the final analysis enlarge the prosperity of all. One of the best proofs that reality hinges on moral foundations is the fact that when men and governments work devotedly for the good of others they achieve their own enrichment in the process.

The universe is so structured that things go awry if men are not diligent in the other-regarding dimension. "I" cannot reach fulfillment without "thou." The self cannot be without other selves…. But the real reason we must use our resources to outlaw poverty goes beyond material concerns to the quality of our mind and spirit. Deeply woven into the fiber of our religious tradition is the conviction that men are made in the image of God…. If we accept this as a profound moral fact we cannot be content to see men hungry, to see men victimized with ill-health, when we have the means to help them.

In the final analysis the rich must not ignore the poor because the rich and poor are tied together…. Every nation is an heir to a vast treasury of ideas and labor to which both the living and the dead of all nations have contributed…. When we rise in the morning, we go into a bathroom where we reach for a sponge which is provided for us by a Pacific islander. We reach for soap provided for us by a European. Then at the table we drink coffee which is provided for us by a South American, or tea by a Chinese, or cocoa by a West African. Before we leave for our jobs we are already beholden to more than half the world. In a real sense all life is interrelated. The agony of the poor impoverishes the rich; the betterment of the poor enriches the rich. Whatever affects one directly affects all indirectly.[4] ♦

[1] *Journal and Major Essays of John Woolman*, ed. Phillips Moulton (New York: Oxford University Press, 1971), pp. 128-9.

[2] ibid, pp. 238-9.

[3] John Woolman, *Conversations on the True Harmony of Mankind and How It May Be Promoted,* ed. Sterling Olmstead, (Philadelphia: Wider Quaker Fellowship, 1987), p. 6.

[4] *A Testament of Hope: The Essential Writings and Speeches of Martin Luther King, Jr.*, ed. James Washington, (New York: Harper Collins, 1991), pp 240-1, pp. 624-6.

About John Woolman

☼ As Woolman makes his journey along the Atlantic coast, he speaks of seeing the seeds of great calamity growing before him. How would you describe these seeds? How have they grown? How are they related to Friends' testimonies? Are there other seeds of calamity that you see growing now?

☼ How does Woolman characterize the profit motive? How did he observe and experience exploitation? What challenges that are similar to his observations of exploitation do we face in our daily lives?

About Martin Luther King, Jr.

☼ What links does King make between our moral and spiritual lives and the political and economic systems in which we live? How do the decisions we make in our daily lives reflect our spiritual and ethical lives?

☼ Both Woolman and King suggest that pursing wealth for its own sake leads to spiritual death. Why does King characterize the United States as a nation nearing spiritual death? How might he describe the changes that have occurred since he spoke?

Warning issued on November 18, 1992

WORLD SCIENTISTS' WARNING TO HUMANITY

Some 1,700 of the world's leading scientists, including the majority of Nobel laureates in the sciences, issued this appeal in November 1992. The Warning was written and spearheaded by UCS Chair Henry Kendall.

Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our present course will bring about.

THE ENVIRONMENT: The environment is suffering critical stress:

The Atmosphere: Stratospheric ozone depletion threatens us with enhanced ultraviolet radiation at the earth's surface, which can be damaging or lethal to many life forms. Air pollution near ground level, and acid precipitation, are already causing widespread injury to humans, forests and crops.

Water Resources: Heedless exploitation of depletable ground water supplies endangers food production and other essential human systems. Heavy demands on the world's surface waters have resulted in serious shortages in some 80 countries, containing 40% of the world's population. Pollution of rivers, lakes and ground water further limits the supply.

Oceans: Destructive pressure on the oceans is severe, particularly in the coastal regions which produce most of the world's food fish. The total marine catch is now at or above the estimated maximum sustainable yield. Some fisheries have already shown signs of collapse. Rivers carrying heavy burdens of eroded soil into the seas also carry industrial, municipal, agricultural, and livestock waste — some of it toxic.

Soil: Loss of soil productivity, which is causing extensive land abandonment, is a widespread byproduct of current practices in agriculture and animal husbandry. Since 1945, 11% of the earth's vegetated surface has been degraded — an area larger than India and China combined — and per capita food production in many parts of the world is decreasing.

Forests: Tropical rain forests, as well as tropical and temperate dry forests, are being destroyed rapidly. At present rates, some critical forest types will be gone in a few years and most of the tropical rain forest will be gone before the end of the next century. With them will go large numbers of plant and animal species.

Living Species: The irreversible loss of species, which by 2100 may reach one third of all species now living, is especially serious. We are losing the potential they hold for providing medicinal and other benefits, and the contribution that genetic diversity of life forms gives to the robustness of the world's biological systems and to the astonishing beauty of the earth itself.

Much of this damage is irreversible on a scale of centuries or permanent. Other processes appear to pose additional threats. Increasing levels of gases in the atmosphere from human activities, including carbon dioxide released from fossil fuel burning and from deforestation, ***may alter climate on a global scale***.

Predictions of global warming are still uncertain with projected effects ranging from tolerable to very severe — but the potential risks are very great.

Our massive tampering with the world's interdependent web of life — coupled with the environmental damage inflicted by deforestation, species loss, and climate change — could trigger widespread adverse effects, including unpredictable collapses of critical biological systems whose interactions and dynamics we only

imperfectly understand. Uncertainty over the extent of these effects cannot excuse complacency or delay in facing the threat.

Population: The earth is finite. Its ability to absorb wastes and destructive effluent is finite. Its ability to provide food and energy is finite. Its ability to provide for growing numbers of people is finite. And we are fast approaching many of the earth's limits. Current economic practices which damage the environment, in both developed and underdeveloped nations, cannot be continued without the risk that vital global systems will be damaged beyond repair.

Pressures resulting from unrestrained population growth put demands on the natural world that can overwhelm any efforts to achieve a sustainable future. If we are to halt the destruction of our environment, we must accept limits to that growth. A World Bank estimate indicates that world population will not stabilize at less than 12.4 billion, while the United Nations concludes that the eventual total could reach 14 billion, a near tripling of today's 5.4 billion. But, even at this moment, one person in five lives in absolute poverty without enough to eat, and one in ten suffers serious malnutrition.

No more than one or a few decades remain before the chance to avert the threats we now confront will be lost and the prospects for humanity immeasurably diminished.

What We *Must* Do: Five inextricably linked areas must be addressed *simultaneously:*

1. We must bring environmentally damaging activities under control to restore and protect the integrity of the earth's systems we depend on. We must, for example, move away from fossil fuels to more benign, inexhaustible energy sources to cut greenhouse gas emissions and the pollution of our air and water. Priority must be given to the development of energy sources matched to third world needs — small scale and relatively easy to implement. We must halt deforestation, injury to and loss of agricultural land, and the loss of terrestrial and marine plant and animal species.

a. We must manage resources crucial to human welfare more effectively. We must give high priority to efficient use of energy, water, and other materials, including expansion of conservation and recycling.

b. We must stabilize population. This will be possible only if all nations recognize that it requires improved social and economic conditions, and the adoption of effective, voluntary family planning.

c. We must reduce and eventually eliminate poverty.

d. We must ensure sexual equality, and guarantee women control over their own reproductive decisions.

2. The developed nations are the largest polluters in the world today. They must greatly reduce their over-consumption if we are to reduce pressures on resources and the global environment. The developed nations have the obligation to provide aid and support to developing nations, because only the developed nations have the financial resources and the technical skills for these tasks.

3. Acting on this recognition is not altruism, but enlightened self-interest: whether industrialized or not, we all have but one lifeboat. No nation can escape from injury when global biological systems are damaged. No nation can escape from conflicts over increasingly scarce resources. In addition, environmental and economic instabilities will cause mass migrations with incalculable consequences for developed and undeveloped nations alike.

4. Developing nations must realize that environmental damage is one of the gravest threats they face, and that attempts to blunt it will be overwhelmed if their populations go unchecked. The greatest peril is to become trapped in spirals of environmental decline, poverty, and unrest, leading to social, economic and environmental collapse.

5. Success in this global endeavor will require a great reduction in violence and war. Resources now devoted to the preparation and conduct of war — amounting to over $1 trillion annually — will be badly needed in the new tasks and should be diverted to the new challenges.

***WARNING**: We the undersigned, senior members of the world's scientific community, hereby warn all humanity of what lies ahead. A great change in our stewardship of the earth and the life on it, is required, if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated.*

A new ethic is required — a new attitude towards discharging our responsibility for caring for ourselves and for the earth. We must recognize the earth's limited capacity to provide for us. We must recognize its fragility. We must no longer allow it to be ravaged. This ethic must motivate a great movement, convince reluctant leaders and reluctant governments and reluctant peoples themselves to effect the needed changes. The scientists issuing this warning hope that our message will reach and affect people everywhere. We need the help of many.

We require the help of the world community of scientists: natural, social, economic, political;

We require the help of the world's business and industrial leaders;

We require the help of the worlds religious leaders; and

We require the help of the world's peoples.

We call on all to join us in this task. ♦

☼ **The Scientists' Warning calls for a new "ethic" in the human-earth relationship. What similarities do you see between their views and those of Kenneth Boulding? What differences? What ecological crises do both address? Which were "new" in 1992? Are there others not mentioned in the Scientists' Warning?**

☼ **What spiritual challenges do we face as we come to understand more deeply the nature of our ecological crisis?**

☼ **To what extent can individual actions be an effective response to the crisis this document outlines? To what extent is governmental action required? To what extent are these global issues that must be addressed at all levels of all societies?**

☼ **This statement asks all scientists, religions, and nations to work together in addressing our ecological crisis. What particular role might Quakers have in this effort? How might our traditions be helpful to others in facing the challenges ahead? What can we learn from John Woolman about what we are called to do?**

☼ **In the aftermath of the September 11, 2001 terrorist attacks on New York and Washington, with national attention focused on the threat of terrorism, what can be done to revive the sense of urgency which marks the 1992 document?**

STRUCTURAL VIOLENCE AND FRIENDS TESTIMONIES: SIMPLICITY IS NOT ENOUGH

by Margaret Mansfield

Friends have longstanding traditions of commitment to non-violence, and to putting faith into action to relieve suffering caused by war or other forms of direct violence. In seeking to be faithful to the Peace Testimony, we are called to discover the "seeds of war" around and within us. Many Friends see the Testimony on Simplicity as the key to addressing the seeds of violence in our lives because they realize that high levels of material consumption create economic demand leading to the exploitation of people and planet.

Globalization has increased an awareness of growing numbers of exploited, destitute, and dysfunctional people. This in turn has led a number of policy analysts and humanitarians, including some Friends and Friends organizations, to view oppressive political, economic, and social policies as a form of violence they identify as **"*structural violence.*"**

Hidden from view, structural violence occurs when physical and psychic harm results from systemic policies that do not directly rely on overt force. For example, each year far more people die from hunger-related diseases than from war and other forms of human physical violence. Sociologist Susan James describes structural violence as "…nested within three systems – the socio-political, the socio-environmental, and the psychological."

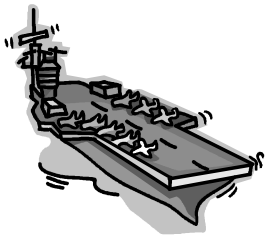
John Woolman revealed to slave masters the ways slavery, the epitome of structural violence, damaged those who materially benefited as well as those who were oppressed directly. The institution of slavery embroils master and slave alike in a web of economic, social, and political relationships that violate Gospel Order. As structural violence increases, it constricts lives, limits choices, saps energy, diminishes creativity, and burdens the Spirit.

Characteristics of Structural Violence

Structural violence has four major characteristics.

• Structural violence is ***hard to recognize*** because it is embedded in the institutions that govern our lives. It tends to hide complex, interrelated causes, and to reveal only distressful outcomes. Most people who make and carry out policy decisions are not motivated by malice. Structural violence results from a system that leads people to do bad things for what seem to be good reasons.

For example, most legal systems give priority to protecting property rights over meeting basic human needs. Current global market forces based on maximizing profits widen the gap between rich and poor both within and among nations. In large cities, heavy automobile use condemns many individuals to the stress and frustration of traffic jams, the risk of accidents, and diseases from air pollution. Consumer culture devalues social relationships and distances people from one another by teaching us to seek happiness in objects.



• Structural violence is ***short-sighted*** in the sense that it damages everyone, the exploiters as well

as the exploited, and diminishes the ethical and spiritual qualities of the whole society.

For example, in 1990, the International Monetary Fund required the government of Peru, as a condition of preventing a financial crisis, to privatize publicly owned businesses and to reduce social welfare expenditures. These "austerity measures," referred to as a Structural Adjustment Program, caused such extreme food shortages that prices increased more than 500% within days. As reported by Larry Everest in "The Selling of Peru,"[1] by 1991, only five percent of Lima's workforce was fully employed, and over half of Peru's population had incomes more than 15% below the bare minimum needed to meet basic needs.

• Structural violence is ***self-reinforcing***. In many conditions of poverty, interrelated positive feedbacks involving inadequate nutrition, health care, education and economic opportunity, create a vicious cycle from which there is virtually no exit within the rules.

The governments and citizenry of many developing nations are overwhelmed by ever-increasing debt burdens. This "debt spiral" has also confounded the international organizations whose original purpose was to stabilize international currency and trade. Policies that protect the interests of the international financial community at the expense of providing basic sanitation, education and health care further devastate poor people, widening the gap between rich and poor and fueling cycles of despair and poverty. Seeds of terrorism take root in the context of such self-reinforcing cycles.

• Finally, structural violence ***promotes scapegoating***. When people blame the victims or the agents of the policies leading to violence they divert attention from the underlying systemic causes.

Labeling welfare recipients "welfare queens" and corporate "fat cats" as "greedy" are examples of polarizing language that deflects attention way from public policies and their administration.

In a world where some people enjoy material abundance, close to three billion people — almost half the world's population — live on less than two dollars a day! Institutional indifference to chronic hunger and treatable diseases systematically violates the basic right of people everywhere to live full, healthy, spiritually rewarding lives. Fear of terrorism, and intrusive laws passed in the wake of that fear, are but one example of how structural violence erodes civil liberties and undermines the ability of individuals to make their own religious and ethical choices.

Structural Violence from an Ecological Perspective

The concept of structural violence has been developed primarily by those who are most concerned about social and economic justice. But the same considerations that affect human social relationships apply to the human-earth relationship. From an ecological perspective, the short-sightedness associated with human injustice is a specific example of a more general and global biological myopia on the part of our species. Structural violence to the biosphere is antithetical to the purpose of creating an ecologically sustainable economy and society.

Systematic damage to the earth's life-sustaining cycles through human-induced disasters — species extinction from loss of habitat, the death of forests and lakes from acidification, and climate change from excessive greenhouse gas emissions — is also structural violence. Just as inequitable distribution of wealth constitutes structural violence when it deprives people of food and water they need to survive, so too does degrading the soils and destabilizing the climate on which food production depends. The prospects for future generations are likewise diminished as aquifers are depleted, arable lands turn into deserts, and limited material resources are exhausted by the current system.

Why Simplicity is Not Enough

The Testimony on Simplicity is important, both as a spiritual exercise, and as an element in addressing problems of structural violence. By demonstrating that quality of life is not a function of material consumption, we help facilitate

structural changes, and this kind of demonstration is an integral part of our religious tradition. George Fox set being "patterns and examples, that your carriage and life may preach," as a precondition to "walking cheerfully over the earth answering to that of God in every one."

It is also important to recognize that people make choices in the context of systemic expectations, products, and incentives. Without intention or design, institutional structures limit our spiritual, ethical, and practical choices. Our individual choices are only a small part of a global whole made up of many interrelated economic, social, political, and ecological systems. Understanding the dysfunctional aspects of these systems and helping to change them is as essential as faithfully living the Testimony of Simplicity.

Structural violence is, by definition, part of the human social system, which is perhaps the most complex of any known system except for the earth's global ecosystem that contains it. Of the systems within the global social system, the economic system is perhaps the one whose influence can best be understood and managed. For Friends to advance peace and justice within the global social system, and to harmonize it with the earth's global ecosystem, it is important both to examine our own lives for the "seeds of war," and to learn as much as we can about systems of which we are a part, so that we can be knowledgeable participants in efforts to bring about systemic change.

In summary, structural violence has four major characteristics: it is hidden, short-sighted, self-reinforcing, and promotes scape-goating that deflects attention from root causes. Within the current global financial architecture, the mass consumption of the relatively wealthy may well be what keeps the global economy afloat. When we see our testimonies as interrelated parts of a complex, structural whole, we can recognize patterns of violence embedded in our economic, social, and political institutions. By promoting institutional change to provide for everyone's basic needs within the earth's sustainable yield, we can begin to reverse the conditions that create structural violence, bringing us closer to a world at peace and with justice, where everyone's potential can be fulfilled. ♦

[1]http://www.zmag.org/Zmag/articles/sept94everest.htm

☼ **Where did Woolman, King, and Boulding see structural violence at work? What conditions does each describe that might be characterized as structural violence?**

☼ **What experiences have you had that seem to be aspects of structural violence? How would you explain structural violence to someone who said they didn't know what it referred to?**

☼ **How does the ecological crisis outlined in the Scientists' Warning contribute to structural violence?**

☼ **How does structural violence relate to the testimony on simplicity? To other testimonies?**

ECOLOGICAL FOOTPRINT ANALYSIS

by Hollister Knowlton

based on *Our Ecological Footprint* by Wackernagel and Rees[1]

Purpose

Ecological footprint analysis was developed to illustrate the trends of increasing pressures on ecosystems, and extremes of wealth and poverty. It make it possible to compare various lifestyles in terms of how much land is needed to support them.

Definition

Ecological Footprint is a rough estimate of the amount of land, expressed as hectares or acres per person, that would be needed in order for renewable resources to provide all the food and water, shelter, possessions, energy, and other physical requirements, including the recycling of wastes, of a particular lifestyle.

Explanation

This idea, first used by William Rees and more fully developed by his student Mathis Wackernagel, is to determine how much biologically productive land area is needed to supply all the resources and absorb all the wastes generated on a continuing basis by a particular population or lifestyle. Although a population occupies a territory, it uses resources from all over the world. The ecological footprint is the combined size of these areas, wherever they may be on the planet. The idea was first applied to a region. For example, the region that includes Vancouver, BC, where the concept was initially developed, uses resources requiring 19 times as much land as the region itself. London, which is more densely populated, uses a land area 200 times the size of the city. A region's per capita footprint is calculated by dividing the total land area required to supply the region's people by the number of people in the region..

Wackernagel, Rees, and their colleagues, have now calculated "ecological footprints," expressed as land required per person, for numerous cities and countries, based on the total number of people and total consumption of goods and services. "Ecological footprint" can also be used as a way to illustrate the relationship between the total human use of the earth's resources and the earth's carrying capacity, and also what an equitable distribution of the earth's resources would be.

How Much Useable Land Is There?

The total Earth surface area is a known quantity – approximately 126 billion acres. The exposed land surface area is roughly 36 billion acres. Subtracting for land that is desert, built over, paved, or covered by ice or fresh water, and adding a factor for productive ocean and fresh water habitat, there remains about 28.5 billion acres available to share.

What Is the "Fair Share"?

With six billion humans, if we were to share equally (on a sustainable basis, with no space exclusively for wildlife)**…***there is enough land for each human to use the goods and services provided by 4.75 acres.*

How Much Are We Humans Actually Using? Who Is Using How Much?

The world average per capita footprint, based on 1999 data, was 6 acres. This is larger than "fair share," which suggests that humans are using more than the earth's annual yield and are consuming its natural capital.

There is a huge range in the ecological footprints of various nations — from 1.3 acres in Bangladesh to 24.0 acres in the U.S. For more information, see the list in the Ecological Footprint exercise in the *Seeds of Violence, Seeds of Hope: Group Activities and Exercises* manual. accompanies this volume.

In addition to the calculations that have been done for various cities, regions, and nations, you can calculate your own footprint at two web sites: **www.earthday.net/footprint/info** and **www.lead.org/leadnet/footprint.** Remember that ecological footprint is a rough approximation, not a rigorous measure, and that the size of a particular person's footprint is determined by a combination of personal decisions made by individuals, and societal decisions over which individuals have little control. ♦

[1]Wackernagel and Rees, *Our Ecological Footprint: Reducing Human Impact on Earth*, (Philadelphia, PA: New Society Publishers, 1996).

☼ **What aspects of lifestyle and consumption seem most important in influencing the size of one's ecological footprint?**

☼ **What aspects of our nation's political and social priorities seem most important for affecting ecological footprint?**

☼ **The biggest share of a developing nation's footprint comes from its production of food, while the biggest share of an industrial nation's footprint comes from its uses of energy. What questions does this reality raise for us?**

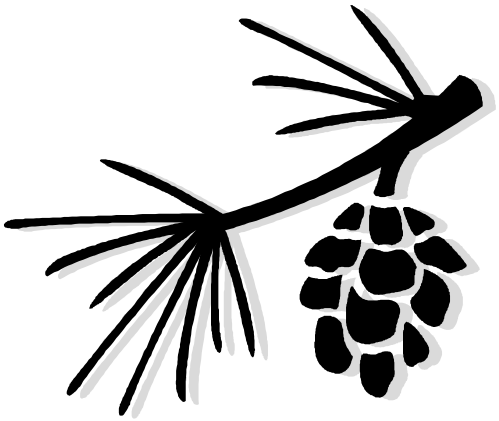
☼ **How does our ecological footprint relate to Friends testimonies on equality, simplicity and integrity? How might these testimonies lead us to decrease our footprint?**

☼ **How do you think your own ecological footprint would compare to the U.S. average? [To find out, refer to the websites above.] How much of your ecological footprint do you think of as being within your control? What would it take to reduce your ecological footprint to a global "fair share" of 4.75 acres?**

OVERVIEW OF THE NATURAL STEP

by David Damm-Luhr

The Natural Step (TNS) is both a planning framework and a network of organizations dedicated to promoting ecologically sustainable development in business and government at all levels. Karl-Henrik Robèrt, a medical doctor and head of a cancer research institute in Sweden, and his collaborator, physicist John Holmberg, originated the framework in the late 1980's as a simple conceptual tool for applying science-based principles to consider human-earth interactions at a variety of scales. Their approach leaves analysis of details and decisions about what to do in specific places with particular conditions and requirements to the people in those places and circumstances.



For Robèrt and Holmberg, it's important that

- the human economy be viewed as a subset of the ecosystem at each scale;
- individuals be able to see how their actions aggregate from the micro to the macro scales;
- individuals not be expected to act against their own self interest;
- the framework brings people together to take action within today's economic reality; and
- the framework encourages a focus on describing a desired future and on steps to get there, rather simply extrapolating an approach from present conditions.

Robèrt and Holmberg start with a "cyclic principle" — that flows of matter and energy in human economies must be processed in ways that are compatible with cycles of nature. They define Four System Conditions that are the backbone of their framework and provide a guide or "compass" for any activity at any scale in terms of its contribution to ecological sustainability:

- **Substances from the earth's crust must not systematically increase in the biosphere** (e.g., we must not release substances like lead, mercury, and fossil carbon into the biosphere at a faster rate than natural cycles can return them to the earth's crust).
- **Substances produced by society must not systematically increase in the biosphere** (e.g., we must not release substances like PCBs and CFCs at a faster rate faster than natural processes can decompose them).
- **The physical basis for the productivity and diversity of nature must not be systematically diminished** (i.e., we must not harvest more from nature than nature is able to replace, we must not release substances in quantities sufficient to disrupt natural processes, and we must not appropriate too much land for exclusively human uses).
- **We must be fair and efficient in meeting basic human needs** (i.e., unless everyone's basic needs are met they will not participate in adhering to the first three conditions).

Robèrt uses these system conditions to envision a "funnel" that society is entering because the system conditions are being violated. The more the system conditions are violated, the more likely it will be that the violators will "hit the wall" of the funnel, and suffer the consequences. Those businesses, communities, and nations that begin now to take the path of "the natural step" will be more likely to get through the opening in the funnel as others hit the wall.

Since the late 1980's in Sweden, The Natural Step has grown to be an international network of non-profit educational organizations, facilitating

effective use of the TNS conceptual framework. As part of this work, these "TNS" units have developed strategies and tools for use by corporations and municipalities to use in a variety of settings, often in conjunction with other less rigorous sustainable development programs (e.g., ISO 14001 standards, CERES principles).

A number of major corporations, most notably IKEA, Electrolux, Interface, Collins Pine, and Scandic Hotels, are embracing the principles and transforming their operations. In addition to their use for strategic planning, the TNS "system conditions" are used for problem solving, developing consensus documents, and structuring course curricula and scientific work. ♦

For Further Information

Nattrass and Altomare, *The Natural Step for Business*, 2nd ed., New Society Publishers.
Robert, *The Natural Step*, Pegasus Communications.
Waage (ed.), *Ants, Galileo and Gandhi: Designing the Future of Business,* Greenleaf Publishing.
www.naturalstep.org.

☼ **How would you describe the basic TNS principles to someone who isn't familiar with them? How are they related to the ecological crisis described in the Scientists' Warning? In what ways would each be apt to affect the size of our nation's ecological footprint?**

☼ **What spiritual and ethical values underlie TNS? Is TNS similar to or different from Boulding's spaceship ethic?**

☼ **TNS focuses on voluntary actions by commercial and industrial companies. What might governments do to support TNS principles? What might individuals do?**

☼ **How would the principles of TNS help address structural violence?**

RISING TO THE CHALLENGE a Summary from *Plan B*

by Lester R. Brown, Earth Policy Institute

Throughout history, humans have lived on the earth's sustainable yield—the interest from its natural endowment. But now we are consuming the endowment itself. In ecology, as in economics, we can consume principal along with interest in the short run, but in the long run it leads to bankruptcy.

There are solutions to the problems we are facing. *Plan B* is a massive mobilization to deflate the global economic bubble before it reaches the bursting point. Keeping the bubble from bursting will require an unprecedented degree of international cooperation to stabilize population, climate, water tables, and soils—and at wartime speed. All the things we need to do to keep the bubble from bursting are now being done in at least a few countries. Here are the eight priorities for rescuing a planet under stress and creating a more sustainable future.

We can build an economy that does not destroy its natural support systems.

Stabilize World Population

Stabilizing world population at 7.5 billion or so is central to avoiding economic breakdown in countries with large projected population increases that are already overconsuming their natural capital assets. Some thirty-five European countries and Japan have essentially stabilized their populations. The challenge now is to create the economic and social conditions and to adopt the priorities that will lead to population stability in all remaining countries. The keys here are extending primary education to all children, providing vaccinations and basic health care, and offering reproductive health care and family planning services in all countries.

Shift to a Hydrogen-based Energy Economy and Develop Renewables

Shifting from a carbon-based to a hydrogen-based energy economy to stabilize climate is now technologically possible. Advances in wind turbine design and in solar cell manufacturing, the availability of hydrogen generators, and the evolution of fuel cells provide the technologies needed to build a climate-benign hydrogen economy. Moving quickly from a carbon-based to a hydrogen-based energy economy depends on getting the price right, on incorporating the indirect costs of burning fossil fuels into the market price.

Raise Water Productivity

Failure to stop the fall in water tables by systematically reducing water use will lead to the depletion of aquifers, an abrupt cutback in water supplies, and the risk of a precipitous drop in food production. In pioneering drip irrigation technology, Israel has become the world leader in the efficient use of agricultural water. This unusually labor-intensive irrigation practice, now being used to produce high-value crops in many countries, is ideally suited where water is scarce and labor is abundant.

Save Our Soils

In stabilizing soils, South Korea and the United States stand out. South Korea, with once denuded mountainsides and hills now covered

with trees, has achieved a level of flood control, water storage, and hydrological stability that is a model for other countries. Beginning in the late 1980s, U.S. farmers systematically retired roughly 10 percent of the most erodible cropland, planting the bulk of it to grass. In addition, they lead the world in adopting soil-conserving practices. With this combination of programs and practices, the United States has reduced soil erosion by nearly 40 percent in less than two decades.

Create an Honest Market

The key to restructuring the economy is the creation of a market that tells the ecological truth. As the global economy has expanded and as technology has evolved, the indirect costs of some products have become far larger than the price fixed by the market. The price of a gallon of gasoline, for instance, includes the cost of production but not the expense of treating respiratory illnesses from breathing polluted air or the repair bill from acid rain damage. Nor does it cover the cost of rising global temperature, ice melting, more destructive storms, or the relocation of millions of refugees forced from their homes by sea level rise. Once we calculate all the costs of a product or service, we can incorporate them into market prices by restructuring taxes.

Tax Polluters More and Workers Less

The need for tax shifting—lowering income taxes while raising taxes on environmentally destructive activities—in order to get the market to tell the truth has been widely endorsed by economists. The basic idea is to establish a tax that reflects the indirect costs to society of an economic activity. For example, a tax on coal would incorporate the increased health care costs associated with breathing polluted air, the costs of damage from acid rain, and the costs of climate disruption. Nine countries in Western Europe have already begun the process of tax shifting, known as environmental tax reform.

Shift Subsidies

Each year the world's taxpayers underwrite $700 billion of subsidies for environmentally destructive activities, such as fossil fuel burning, overpumping aquifers, clearcutting forests, and overfishing. A world facing the prospect of economically disruptive climate change, for example, can no longer justify subsidies to expand the burning of coal and oil. Shifting these subsidies to the development of climate-benign energy sources such as wind power, solar power, and geothermal power is the key to stabilizing the earth's climate.

Provide Universal Basic Education, Clean Water, Sanitation, and Health Care for All

Following the terrorist attacks on the World Trade Towers and the Pentagon on September 11, 2001, several world leaders suggested a twenty-first century variation of the Marshall Plan to deal with poverty and its symptoms, arguing that in an increasingly integrated world, abject poverty and great wealth cannot coexist. Gordon Brown, UK Chancellor of the Exchequer, notes that "Like peace, prosperity is indivisible and, to be sustained, it needs to be shared." French President Jacques Chirac told the Earth Summit in Johannesburg in early September, 2002, that "the world needs an international tax to fight world poverty." Juergen Schrempp, CEO of DaimlerChrysler, said in a speech at the US Chamber of Commerce that the question is not, Can we afford another Marshall Plan? The question is, Can we afford ***not*** to have another Marshall Plan?

Rise to the Challenge

History judges political leaders by whether they respond to the great issues of their time. For today's leaders, that issue is how to deflate the world's bubble economy before it bursts. This bubble threatens the future of everyone, rich and poor alike. It challenges us to restructure the global economy, to build an eco-economy.

We can build an economy that does not destroy its natural support systems, a global community where the basic needs of all the earth's people are satisfied, and a world that will allow us to think of ourselves as civilized. This is entirely doable.

The choice is ours—yours and mine. We can stay with business as usual and preside over a global bubble economy that keeps expanding until it bursts, leading to economic decline. Or we can adopt *Plan B* and be the generation that stabilizes population, eradicates poverty, and stabilizes climate. Historians will record the choice, but it is ours to make. ♦

From: Lester R. Brown, *Plan B: Rescuing a Planet Under Stress and a Civilization in Trouble,* (New York: WW Norton & Company, 2003).

See also Lester R. Brown, *Eco-Economy: Building an Economy for the Earth,* (New York: WW Norton & Company, 2001).

To download or order: www.earth-policy.org.

☼ **What is your reaction to Brown's proposals? Do you see them as offering a good "first step?" What specific proposals do you see as most important?**

☼ **How do Brown's proposals relate to TNS principles? To Boulding's spaceship ethic?**

☼ **To what extent would Brown's proposals, if implemented, require changes in the lifestyles of citizens of the U. S. and other wealthy nations?**

A PERSPECTIVE ON ECOLOGICAL INTEGRITY AND THE ROLE OF MARKETS, FINANCE AND GOVERNANCE

by David Ciscel and Ed Dreby

We believe that Friends have a religious obligation to promote a human-earth relationship characterized by ecological integrity.

Ecological integrity is possible when the amount of ecosystem change introduced by humans is such that other species can adapt and the ecosystem's biotic functions can continue to operate. Without ecological integrity, efforts to advance peace, justice, and economic opportunity for all will soon be overwhelmed by environmental and economic crises.

Existing economic policies and expectations are leading markets and finance to promote ecological and social disintegration. Human economies, if they are to flourish, must become concerned to preserve and enhance the earth's biological productivity and resilience. This is a reality that Friends cannot afford to ignore.

A sustainable economic system needs to contain self-regulating mechanisms to limit its physical throughput (its inputs from and outputs to the environmment). Resource inputs to the human economy must not exceed the earth's sustainable yield, and outputs in the form of waste products need to be as biologically benign and degradable as possible.

No one knows the ecologically sustainable limits of total throughput. However, scientific research reveals that these limits have already been exceeded in some areas. For example, it is a fact that limits have been exceeded with respect to "greenhouse gas" emissions and the chemical composition of the atmosphere.

Economic growth as currently defined is the annual rise in per capita Gross Domestic Product. This seems to mean using more resources and energy every year. Corporations are committed to growth for future profitability, individuals to increase income and savings, and governments to satisfy popular and powerful constituencies. These expectations are at odds with creating a more ecologically integrated economy on a finite planet.

If human economies are to become sustainable, producers, consumers, and investors must all look beyond "more" when defining their economic well-being. Capital investment and entrepreneurial ingenuity should be directed toward creating a cyclical production system, whereby one product's wastes become another product's raw material. The use of non-renewable resources ought to include provisions to create renewable substitutes. Income and wealth must begin to be distributed so as to preserve and enhance the wellbeing of people and communities within a context of limiting the total throughput of material and energy.

How can markets, money, and finance be made to operate under conditions in which either total consumption does not grow, or economic growth is redefined to mean that which occurs within biophysical limits? This will require replacing policies that are meant to spur more demand or more supply, with economic manage-

ment directed toward a different set of goals. Sustainable economies will focus not on perpetual expansion but on human well-being within a context of ecological well-being.

Institutional resourcefulness, creativity, and experimentation are essential. It will take time to learn how existing institutions can be modified to function within the earth's biophysical limits. Because we cannot know how the system must change to serve a different purpose until that purpose is served, we need to consider two approaches that are often presented as an either/or choice: reorienting policies within the existing institutional framework, and redesigning institutions to create a new framework.

Current incentives make market and financial systems function impressively for growth, but with scant regard for distributing wealth and income fairly or for minimizing ecological damage. Our economic incentives need to change, and experimentation is the path to understanding how positive change can be effected. To advance Friends testimonies on peace, justice, and equality, we must devise economic policies, institutions, and incentives that provide for human well-being while limiting our uses of the earth's bounty and protecting its ecological resilience and integrity. ♦

☼ **In different ways and from different perspectives, all the readings urge us to live, as Boulding says, "in the whole system." How is this admonition related to our testimonies, particularly to our testimony on integrity?**

Seeds of Violence, Seeds of Hope

Volume I: The Reader

SECTION 2

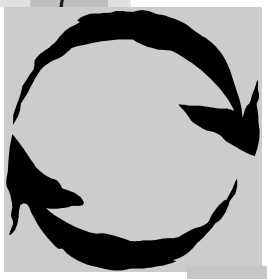
FUNDAMENTAL ECONOMIC CONCEPTS AND PERSPECTIVES

This section consists of four descriptive articles that explain the basic economics concepts and policy perspectives.

CYCLES AND GROWTH IN NATURE AND ECONOMIES

by Ed Dreby and Margaret Mansfield

In 1968, the Apollo 8 astronauts took the first photographs of the earth from space and spoke of seeing our planet from afar for the first time: "… a tiny, lovely, and fragile blue marble hanging in the blackness of space…." The photographs were widely seen throughout the world. Perhaps they will come to be seen as pivotal in the evolving perception of the human-earth relationship.



Several years earlier two popular books were published: Rachel Carson's *Silent Spring,* about the threats to wildlife from pesticides, and Paul Ehrlich's *Population Bomb,* about the threats to humanity from population growth. About the same time, Quaker economist Kenneth Boulding wrote an article, "The Economics of the Coming Spaceship Earth." In it he described some essential changes in thinking and policy made necessary by the ecological impacts of human population, affluence, and technology. He characterized these changes as shifting from "cowboy" economics to "spaceship" economics. His article was preceded by a short talk in 1965, "Earth as a Spaceship." A transcription of this talk is the first reading in Section 1 and is followed by an excerpt from his longer article.

Boulding is best known to Friends as author of the Naylor sonnets and as a proponent of peace studies. In the wider society, however, he was a prominent economist. He was among the first in his field to call attention to the failure of modern economic thought to address the need for adapting to an earth that had suddenly become, relative to the human population it supports, much smaller and more fragile.

Kenneth Boulding was not an ecologist, and he was a strong advocate for the benefits of markets. But the issues he raised reflected an ecological perspective: the encroachment of humans on the habitats of other species, the need to find substitutes for non-renewable resources without exceeding the sustainable yield of renewable resources, and the possibility that human wastes would exceed the earth's capacities to absorb them, thereby hampering geophysical processes.

He also identified these as systemic problems in which our economic institutions have a central role.

Silent Spring is widely credited with inspiring the U.S. environmental movement that spawned Earth Day in 1970, the founding of the U.S. Environmental Protection Agency, and much federal and state environmental legislation. Environmental pollution has been widely recognized by many as a serious problem, and although specific environmental problems are far from "solved," many of them have been lessened through public policy.

But the systemic problems of modern industrial societies that Boulding described almost 40 years ago have yet to be recognized or addressed by those who wield power and influence. Even though more is now known about human impacts on global and regional ecosystems, little has yet been done to significantly reorient industrial societies' economic policies or institutions. The

changes of the past quarter century have, if anything, intensified these impacts.

Cycles in Nature

The earth is for all practical purposes a closed physical system (although it receives energy from the sun and radiates energy into space). Except for incoming meteorites and outgoing rockets, no physical material either enters or leaves the earth. God's miracle of life has relied on the sun's energy to create increasingly complex communities of organisms that interact with the earth and one another in mutually-sustaining and transforming ways. While the law of the jungle may be "eat or be eaten," the law of self-sustaining life is "eat ***and*** be eaten," which is to say that everything is recycled. Every critter's wastes and remains become some other critter's food.

Earth's processes gradually produced living cells that use energy from the sun and molecules from the earth to reproduce themselves. Over a period of several billion years, these organisms have transformed the biosphere, within which life is contained, toward miraculously greater diversity and complexity. Within the whole-earth process there are many contributing sub-processes and cycles. These include two of particular importance: ecological processes — which involve the relationship of living things with one another and their environment; and geological processes — which involve relationships between the earth and the sun, within the earth's crust (lithosphere), and between the lithosphere and the biosphere.

Through geological processes,

- the earth's atmosphere, oceans, and living creatures have co-evolved over time to create and sustain conditions in which the life of today can flourish, and
- water, carbon, nitrogen, and other substances cycle between the biosphere and the lithosphere in ways that enables life to participate in and adapt to change.

Through ecological processes,

- plants get energy directly from the sun and minerals and water directly from the earth,
- animals get energy and nourishment by eating either plants or other animals, and
- humans have altered the evolutionary pathways of plant and animal nourishment through the use of fire, tools and complex social structure.

Until about 200 years ago, most of the energy used by humans related to ecological processes: new technologies were based on energy available from fire, plants, other animals, water, and wind. Although on a human scale, the rate of technological change was usually imperceptible, on an ecological scale it occurred quickly. The increasing pace of technological development first occurred during the advance and retreat of glaciers about 40,000 years ago. During the past 10,000 years, with the invention of agriculture, technological development and its impacts became much more rapid on an ecological time scale.

About 1800 C.E., the Euro-American cultures, which had already developed social and economic organizations that led them to expand more rapidly than most others, began using much more energy to implement an industrial revolution. This was possible by burning coal, oil, and natural gas — energy from the sun that had been stored in the earth through geological processes over millions of years .

In the 20th century, human industry developed technologies to create new substances for many purposes. Some, like rubber and nylon, are

designed to replace or improve on those derived more directly from natural resources. Others, like plastics and pesticides, are designed to purposely circumvent or disrupt ecological process. These technologies, and the fossil fuels driving them, help to produce the huge array of goods and services available in today's advanced economies. Their use, however, is also changing the underlying physical and chemical characteristics of the biosphere. Modern technologies are thus requiring life as we know it, which has evolved over millions of years, to rapidly adapt to swiftly changing conditions in order to survive.

Modern technologies are requiring life to rapidly adapt in order to survive.

Growth and Adaptation in Nature

Life's capacity for self-reproduction entails an inherent potential for population growth. It also entails a contrasting potential, on which survival depends, for adapting to environmental limitations and participating in complex ecosystems. Single-cell organisms that reproduce by cell division double their numbers with every generation. Repeated doublings enable populations of bacteria, for example, to expand very quickly, almost explosively — an example of what mathematicians refer to as exponential growth. Limitations of habitat (usually food supply), control the populations by balancing the reproduction of some with the death of others. Otherwise, an expanding population may crash to extinction, or decline to adapt and survive in a smaller ecological niche.

The potential for exponential growth of single-cell organisms appears to have transformed the nature of life on earth at least three times. The first was a population explosion of organisms that excreted carbon dioxide and over time created an atmosphere in which carbon dioxide was the dominant gas. The second was a population explosion of organisms that evolved through genetic mutation to consume carbon dioxide and excrete oxygen. This created an atmosphere containing oxygen. Then still different and increasingly complex organisms evolved that consume oxygen and excrete carbon dioxide, and thus a chemo- and thermo-dynamically stable atmosphere was created.

Sexual reproduction provides for greater genetic diversity and for evolution by natural selection through the differential production of offspring. The combination of genetic diversity (every critter's body and behavior is not quite the same as any others') and differential production of offspring (the genes of those who produce more offspring are more prevalent in shaping the bodies and behavior of the next generation) enables species to adapt to changing environments and to co-evolve with other species. It also provides for possibilities that two parents may have one, two, five, seven, or hundreds of offspring through which populations of various creatures and their overlapping habitats maintain balance over time.

Growth and Adaptation in Human Culture

Culture has enabled humans to transcend the limitations of specific habitats. Like life itself, culture offers potentials for both exponential growth and sustainable balance. Over the course of the past two centuries, industrialization has made it possible for many people to enjoy better food and health, and a much higher standard of living. But it has done this at great cost to many other people. It has also brought about a more rapid transition of the earth from Boulding's descriptions of an "empty illimitable space" to a "full small sphere" in which human activities have become disruptive of earth process.

Today we are seeing the physical expansion of human enterprise with minimal consideration

of ecological balance. With no "empty places" left to settle, we confront the limitations of the global habitat. Any list of environmental problems points to an underlying ecological reality: the human species, especially in industrial societies, is not only failing to participate in complex ecosystems, but is also causing their disintegration and destruction. We can see the characteristics of exponential growth not only in human numbers, but also in the number of human artifacts: consumables and possessions, the machines that make them, and money — the invention that mediates between people and their machines and possessions.

Clearly the human population cannot continue to grow forever. Nor can the amount of land humans use, or the number of houses, cars, roads, and factories we build. Yet our public policies continue to promote, and require, economic growth as a solution to our problems. The expectation of making more money by earning high rates of returns on savings has become an essential component of the nation's social security system for many citizens.

It has now been almost 40 years since Kenneth Boulding identified the need to adapt our society and economy to a smaller and more crowded earth. During this period, many people have become aware of the changes humans are creating in earth process, and public policy has been developed to "protect" the environment. But only a few economists have begun to consider what needs to be done to fit the now-global economy into the biosphere.

There are two clear trends occurring in today's regional economies and the global economy:

- the expansion of human economic activities is damaging regional and global ecosystems, and
- the wealthiest are becoming wealthier and the number of impoverished people is increasing.

While economic expansion has a direct and obvious effect on ecosystems and resources, so do extremes of wealth and poverty. These factors contribute to violent conflicts, which in turn devastate ecosystems. If one considers cause and effect, then concerns for peace, social justice, and protecting the biosphere must be intertwined.

Why are these trends occurring? What explanations do economists provide? What explanations are provided by the critics of current economic theory? How can we, as Friends, draw from both perspectives to come to greater unity about economic policy so as to strengthen our corporate witness for peace, justice, and an ecologically sustainable human-earth relationship?

Elements of an Economic System

To begin considering the causes of these dysfunctional trends in more detail, it is important to identify some of the elements that make up the organizational structure of any modern economy.

Markets: A market is the system that brings buyers and sellers together to freely exchange goods and services. If there are many buyers and sellers, prices tend to be fair and outcomes efficient. If there are only a few sellers or buyers, markets can result in unfairly high or low prices and inefficient allocation of resources and distribution of goods.

In a modern industrial economy there are a huge number of markets. Most people don't make most things for themselves in the industrial world, but instead buy products and services for their households in the marketplace.

Similarly, most people work for wages and salaries to earn incomes in order purchase those goods and services. In addition to markets for

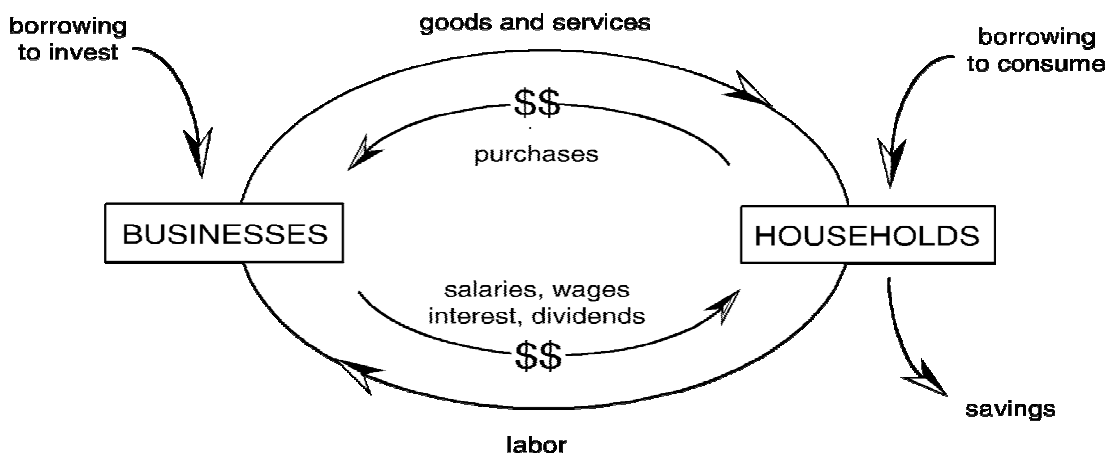
goods and services, there are markets for land, labor, and a great many different kinds of capital. If the society is to prosper, it is important for markets to function fairly and efficiently.

Money and its circulation: Money circulates in a market economy between businesses and households, as do the goods and services for which money is exchanged. Modern economies contain cycles that are in some ways similar to the earth's biological and geological cycles. However, a fundamental difference is that economies are open systems, not closed like the earth. They receive material inputs from, and discharge material outputs to, the surrounding ecological systems. Nor are they limited in size, except by the social and ecological systems that sustain them.

Much of contemporary economics focuses on analyzing the flows of goods, services, and money in markets, which are represented in their most simple form by a Simple Circular Flow Diagram.

Prosperity is created by the cycling of goods, services, and money between businesses and households. When people decide to save part of their income instead of spending it, their savings are temporarily withdrawn from the circular flow. Savings may be returned to the flow in two basic ways: they may be used by the business sector to finance new investment, or they may be borrowed by another household for consumption. In either case, people expect to receive a return on their savings in the form of interest, dividends, or rent.

SIMPLE CIRCULAR FLOW



Capital: A simple definition of capital is wealth used to increase the ability to produce.

Orthodox economists distinguish between:

- **manufactured capital**, traditionally called ***real capital*** or ***physical capital*** — the tools, machinery, factories, trucks, roads, and stores that enable labor to produce more goods and services; and
- **financial capital** — the savings in the form of stocks, bonds, and other financial securities that are used to pay for manufactured capital.

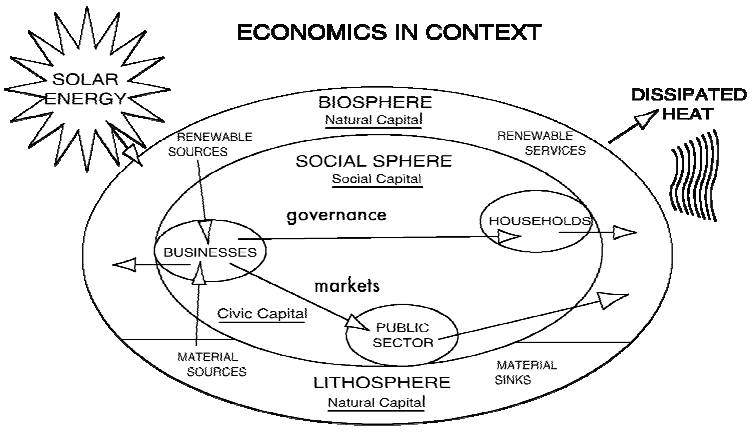
More recently, economists have also distinguished:

- **human capital** — knowledge and skills people acquire through education and training;
- **intellectual capital** — know-how in the form of inventions of many kinds;

- **social capital** — the trust, expectations, and interactive skills developed in families and communities; and
- **natural capital** — physical resources from the earth and its ecosystems.

Investment: For the economy as a whole, an investment refers to spending for new physical capital: a new tool, machine, factory, truck, road, or store. If the investment is successful, there will be an increase in the goods or services provided for people who want them, and a profit for the investor. For an individual, an investment is taking the risk of using savings to own or loan in the business sector.

Interest*:* Interest is money a borrower pays a lender in exchange for being able to use borrowed financial capital over a period of time. When people put savings in a bank to earn interest, they are actually lending it to the bank. The business of a bank is to lend the money to someone else. In a market economy, profits, rents, and other financial returns tend to serve functions similar to interest payments.



The use of one person's savings by someone else for investment or consumption creates a tendency within the system for economic activity to expand. When savings are used in a way that earns interest, the borrower must then do something to pay back the loan plus interest. If the borrower is a household, members of the household are apt to engage in activities to increase their income in order to pay off the debt. If the borrower is a business and the loan is used for new capital, increased production from the investment provides new earnings to pay off the debt. Either way, when savings are invested or loaned, economic activity is apt to increase, and the economy's use of energy and material resources is apt to expand.

If savings are not returned to the circular flow, the total level of spending for goods and services will decline. This may result in a downward spiral of reduced production, employment, income, and spending. Fear of economic decline is one reason there is so much impetus by governments and business alike to encourage households to borrow for consumer spending, and by governments to encourage businesses to borrow for investment.

Another Approach

An emerging field of ***ecological economics,*** in which Kenneth Boulding's ideas have been influential**,** uses models that place the economy in the larger context of the world in which it functions. These models highlight the other kinds of capital, in addition to manufactured and financial capital, that are needed to produce goods and services. For example, large corporations are now very much concerned about the human capital available to them, the quality of a region's workforce, and about protecting their intellectual capital — the new knowledge they have paid to develop — through multilateral enforcement of patents.

Ecological economists tend to emphasize the importance of two other kinds of capital, natural capital and social capital, that are illustrated in the Economics in Context diagram.. They view capital more broadly, as a stock of something that can provide a steady income, or flow of a re-

source, to an economy. Each of the forms of capital provides important flows of useful material and/or energy. Ecological economists ask how market economies can be structured to assure that investments are made to maintain and enhance not only the stocks of manufactured and financial capital, but also the stocks of natural and social capital.

It's fairly easy to understand that if an economic system is to prosper, it needs to be sure its stock of physical capital — its tools, machines, factories, trucks, roads, and stores — is maintained or replaced. A company that begins selling its machinery without replacing it or otherwise begins to "liquidate" its capital stock will produce fewer goods and services.

Ecological economists observe that this is also true of natural and social capital. If the abilities of the natural and social capital stock to provide a steady flow of resources through the economy are not maintained, the economy will decline. At present, natural and social capital are viewed by most economists as "externalities," that is, external to the market system. Ecological economists advocate for models and policies to "account" for the stocks of natural and social capital to be sure these forms of capital are protected, maintained, and enhanced by the economic system.

Many political leaders, and the public at-large, are very concerned about dealing with social and environmental problems, but few people seem to think about the need to invest in the economy's natural and social capital as an alternative way of understanding the causes of social and environmental problems. Many economists have yet to embrace the idea that natural and social capital need to be fully integrated into economic models.

No single model can serve all purposes, and different models can lead to the same conclusions. Whatever models are used to try to increase our understanding, one thing seems certain — economies exist in a social and ecological context; they are not self-sustaining entities. If an economic system doesn't concern itself with maintaining and protecting its stocks of natural and social capital as well as its stocks of manufactured and financial capital, it will go out of business. ♦

MARKETS AND CHOICES

by David Ross and Ed Dreby

Introduction

Understanding economics in its fullest sense means recognizing that we must make choices about spending time and money, collaborating with one another, caring for our surroundings, and participating in our communities. Are you sharing food at a potluck, composting your garden, turning on a light to read a good book, or attending a municipal hearing on open-space ordinances? In each of these examples from daily life, we get something we want, and give up something to get it. Each has economic benefits and costs. This is a reality we easily ignore because we have come to associate economics with only money and markets.

However, modern economics as a discipline does focus on money and markets, which mediate many of the choices that dominate daily life in industrial economies. The subject can be understood as entailing two distinct analytic orientations and two distinct fields of investigation.

Two Analytic Orientations

Positive analysis, or positivist analysis, is the approach taken by most academic economists who view economics as a science. It attempts to provide objective, descriptive answers to "what is" questions about the economy, and to prevent value and ethical preferences from affecting its findings. This method uses mathematical models to describe how economies actually function and to predict outcomes that match real world experience.

Normative analysis refers to "what we want" type questions. Some economists believe that because economics is a social science, it is not possible to separate its findings from considerations of ethics and values. Normative analysis uses theory and empirical findings, combined with value-based perceptions and insights, to promote a given perspective on economic policy. Much policy-related economic analysis is essentially normative analysis because it is used to advocate particular policy choices.

Two Fields of Investigation

Micro-analysis focuses on specific markets and how they are affected by the choices made by consumers, producers, and governments.

Macro-analysis focuses on understanding what influences the overall level of economic activity on regional, national and global scales.

Because industrial economies are so complex, interdependent, and subject to unexpected changes, macro-economics has not had notable success as a predictive science. Micro-economics, on the other hand, has produced accepted economic principles about how markets function. Our purpose here is to describe the most basic concepts of micro-analysis.

What is a Market?

A “market” refers to the process by which buyers and sellers agree on prices for the goods and services they exchange. In the pre-industrial world, markets were a small part of the economy. Most decisions to produce or consume were made in households or villages, or by the decree of someone in authority. Markets became the basis for organizing economic life as innovations in communication and transportation allowed lar-

ger groups of people to interact with one another. This greatly enhanced the benefits from specializing in producing particular goods and services.

Households then turned to markets to earn money and to buy (rather than make) what they needed. Today, some households provide only labor to markets, while others provide physical and financial resources that enterprising individuals use to create specialized businesses. As market-based economies developed, so did the need to understand them. For this reason, markets have become a major focus of economics as a field of study.

A "fully functioning" market is characterized by a unique good or service and many well-informed buyers and sellers.

Basics of Markets, Benefits, and Costs

TANSTAAFL ("there ain't no such thing as a free lunch") is simply a way of saying all choices have consequences. Enrolling one's daughter in a Sunday soccer league means missing Meeting for Worship. Increasing the availability of CT scans for those at risk of lung cancer means reducing spending on other medical needs. According to economic theory, the opportunities we forego as a result of choices we make are among the economic costs we incur — the opportunity costs such as the road not taken, the shirt we didn't buy, the hungry people we failed to feed — because time and resources are limited.

Formal economic theory is constructed as if each of us makes rational choices. We don't pursue activities beyond the point where the additional costs exceed the additional benefits. Our perceptions of benefit and costs as economists use these terms are related to scarcity. If something becomes relatively less scarce, its economic benefit decreases and its opportunity cost increases. A familiar version of this relationship is the "law of diminishing returns." You may be eager for one bowl of ice cream, but are you as eager for a third, fourth, or fifth?

Benefits and costs are also related to the perception of risk. If you value the safety of your children, why do you let them ride in the car with you? Because you don't think the risk of an accident is very high, especially if you are driving. No society has ever chosen to eliminate *all* air pollution, because the costs of doing so are too high. Economics is about tradeoffs between costs and benefits.

Buying and selling in markets can lower the costs of many things we desire. Life would be pretty grim if each family needed a goat for its milk and had to transform rock and fiber into shelter, clothes, and paper. Sharing our possessions is one way to solve this problem. Dividing our tasks among family and friends is another way. Markets divide tasks and share goods and services on a much larger and less personal scale.

Adam Smith, who laid the foundation of modern economics more than 200 years ago, used an example of a pin factory he visited. He observed that the business of making a pin was "…divided into about eighteen distinct operations…all performed by distinct hands.... But if they had all wrought separately and independently, … they certainly could not each of them make twenty, perhaps not one pin in a day." [1]

Markets enable society, and individuals within it, to reduce costs and increase benefits by promoting the division of labor and specialization. By devoting our energies to tasks that we can do relatively faster or better than someone else, and then exchanging the fruits of our labor

(indirectly as wage employees, or directly by selling what we produce), we reduce the costs of daily life and enjoy material well-being beyond our ancestors' wildest dreams.

Micro-economic analysis attempts to understand and describe the complexity of economic relations as the interplay of many different markets. Households operate in markets for employment, goods and services, and earnings on their savings. Businesses operate in markets for ***labor*** (or human capital); ***physical capital*** (or manufactured capital), e.g., machinery and buildings; ***land*** (or natural capital), e.g., energy and material resources; and ***financial capital***.

Economists refer to allocation, scale, and distribution to describe the decisions made by markets: ***allocation*** refers to what gets produced and what is used to produce it; ***scale*** to how much gets produced; and ***distribution*** to who gets it.

Market exchange is the most effective way to share goods and services among large numbers of people.

If buyers want more than suppliers are producing, the price will rise and producers will have an incentive to increase production. If costs of production and therefore prices rise, buyers will make different choices and demand will fall. This is referred to as ***elasticity of supply and demand***. For sellers, if the supply of an essential factor of production is limited, or its cost is too high, expanding production may not be profitable or possible, and the supply of the product will be relatively ***inelastic***. For buyers, if the product is essential to survival, they may be willing, or forced, to pay higher prices, and the demand will be relatively ***inelastic.***

In markets, large groups of individuals usually respond collectively to price and income incentives as if people pursue their self-interest. Following self-interest usually drives markets in the direction of forcing the quantity supplied of any good to just equal the quantity demanded. The ideal of a "fully functioning market" is characterized by a unique good or service and many well-informed buyers and sellers. From the "laws" of supply and demand, fully functioning markets would result in an economy where individuals choose among the greatest range of goods and services at the lowest feasible price.

What Markets Provide and Promote

Voluntary exchange: The theoretical essence of a market is that both the buyer and the seller gain. The buyer must expect to be better off with the product, and the seller must expect to be better off with the goods and services he or she can buy with the money received. Otherwise, there would be no exchange. This is the case whether the participants are individuals, households, or nations. When China sends shoes to the U.S. in return for dollars, China must "believe" it can buy other goods with those dollars that will serve its needs better than keeping the shoes for its own use.

A high price for something communicates that there are people in the society who would welcome more of it. A high price means that buying the product will decrease one's ability to buy other things. In the absence of close relationships and communal unity, market exchange is the most effective means humans have devised for sharing goods and services among large numbers of people. In an ideal world, sharing would be based on spiritual unity, mutual understanding, and love. But history is full of examples where communal outcomes are

driven instead by shaming, arbitrary rules, stereotyping, or the will of the powerful.

Efficiency in the use of resources: The ideal market is efficient in the sense that resources are used to provide consumers with the quality and quantity of goods they are willing to pay for. At the price at which quantity supplied equals the quantity demanded, the cost of providing one more unit is just equal to the benefit. That is, it is clear to everyone in an ideal market that additional costs just equal additional benefits. Everyone is pleased with the outcome. Unfortunately, no such certainty exists for real choices made within real families, corporations, communities, or nations.

Productivity and innovation: To stay in business, producers must provide what the markets demand — that which attracts buyers — and do this at the lowest possible cost. Innovations bring increased productivity and lower costs. Innovations attract new buyers. Entrepreneurs look for new opportunities to make a profit, and in doing so invest in new physical capital. But profitable markets are also eroded by innovations. Hence, innovation tends to turn markets toward the survival-of-the-fittest.

How Markets Fail

There are a host of circumstances under which markets fail in their coordinating task: there is too little or too much produced, the capabilities of human beings are wasted, and gifts of the natural world are abused or wasted. Theoretically, markets that function well would use everyone's labor to its best advantage. But, we know this doesn't happen in practice. We see much harm in the blighted and polluted world around us. No economy has every relied exclusively on market exchange. We must use other institutions to correct for market failures without undermining the ability of markets to serve our interests.

Perspectives from positive economic analysis: From the perspective of positive economic analysis, the breadth and magnitude of social injustice and environmental degradation is the result of multiple market failures and the lack of political will or capacity to correct them. Markets fail in three basic ways: by not restraining negative externalities, by not providing public goods, and by not preventing excessive market concentration.

Negative Externalities are the costs that are external to a market transaction. That is, they are "costs" to a third party, rather than to the seller or buyer, that neither the buyer or seller pays for. For example, there would be significant costs to a home owner if a gas station opened next to it: more traffic and air pollution, noise pollution, chemical poisoning, and a probable loss in resale value of the home.

Negative externalities occur when production results in pollution. The pollution may be hazardous to workers, the neighborhood, those living downwind or downstream, the public at large, the environment as a whole, or future generations. Because businesses do not bear the cost of externalities in their accounting systems, they charge too little for their products, sell too much of them, and make profits at others' expense. Markets tend to promote negative externalities, because an obvious way to cut

costs is to shift them to others. Government intervention is almost always needed to make producers "internalize" the costs of pollution.

Public goods have the characteristic of benefiting many people without distinguishing between those who pay and those who don't. In most market transactions, the seller transfers to the buyer the exclusive right to use the good or service. But consider Fourth of July fireworks. Anyone in the neighborhood can enjoy them, and one person's enjoyment does not diminish another's, but probably increases it instead. Although producing a fireworks display has real costs, if everyone can see them without paying for them, the market has no way to prevent "freeloading."

Market failures result in harm to the many and benefits to the few

Market concentration refers to markets in which a few parties buy or sell most of the product. In this environment, one or a few of the parties can rig prices. Big companies often have economies of scale so that more is produced for consumers at a lower cost. But big companies may also gain an unfair advantage in buying raw materials, hiring and firing employees, or marketing goods and services. This provides higher profits at the expense of suppliers, employees, or consumers. The simplest case is monopoly, where a single firm dominates the market. The outcome is the same if erstwhile rivals cooperate tacitly, or in the proverbial "smoke-filled room."

Failures arising from market concentration provide the logic for antitrust legislation, government regulation, and social or community ownership. Too much market concentration, and the accumulation of wealth it fosters, can also be used to influence government policies. In a vicious cycle, corporations may use excess profits to lobby for public policies that further increase their power in the markets.

Multiple market failures often occur, especially in the area of ecosystem protection. Within the analytic framework of economics, most ecosystem services are public goods, and most environmental harms are caused by negative externalities. Market concentration creates political influence that can block efforts to correct for negative externalities and provide for public goods. Manufacturers lobby against pollution prevention and developers against wetlands preservation. Everyone benefits from reducing pollution. Market failures result in harm to the many and benefits to the few.

Normative and Ecological Perspectives: From a normative perspective based on the values implicit in Friends testimonies, there are additional failures of the market system that are of critical importance to societies and to the human-earth relationship.

- ***Markets promote materialism!*** The conclusion that markets benefit households and the society as a whole depends on the assumption that people can always act on their own best interest. In addition, it assumes that no one has the power to force or manipulate someone else into making a bad choice. Do our relationships based on market exchange replace those based on mutual caring and a common sense of mission? Are our buying habits influenced by manipulative advertising? These are examples of what economist David George calls "preference pollution," meaning that our day-to-day actions and desires are no longer consistent with our

enlightened self-interest, our spiritual values or what we would choose from a place of reflection.

- ***Change can hurt!*** Innovation, ingenuity, and the human capacity to learn are constantly expanding our understanding of what is possible. New enterprises are created while others shut down in a process Joseph Schumpeter named "creative destruction." Particularly in the short-term, and absent altruism or government intervention, many are hurt by innovations and the social change that results. Change not only can destroy communities and jobs; it can destroy the ecosystem. Finding the balance between innovation and stability is a difficult job.

- ***Markets do not provide for equitable distribution of income and wealth.*** The income distribution that emerges through market exchange is usually very unequal. That is because markets have a tendency toward a "winner-take-all" outcome. The impersonality of markets tends to mask society's responsibility for the justice, or injustice, of the resulting income distribution. Extremes of wealth and poverty that markets can create damage the well-being of rich and poor alike. Households that are unable or unwilling to pursue their own best interests in market exchanges are marginalized. Such households include many indigenous peoples, rural and urban underclasses, and physically or mentally handicapped.

- ***Material sprawl.*** Efficient markets are effective in determining how much of a particular good or service consumers will purchase. But they do nothing to restrain aggregate consumption of good and services. The profit motive in markets leads businesses to make as much as possible of whatever they can sell, and to urge consumers to buy as much as they can with whatever income and credit they can gain access to. The result can be a society with huge material excesses; a society that may, at the same time, have a problem with high levels of poverty.

- ***Speculation.*** When markets are slow to adjust to changing conditions, opportunities arise for individuals to buy something solely in anticipation that its price will rise and they will be able to sell and reap an "unearned" profit. This is a phenomenon akin to gambling with all its potentially addictive consequences. The impact of speculation on the functioning of markets remains a challenging research topic for academic economists.

Markets and Public Policy

Policy interventions to correct for market failures have typically been of three kinds: regulations, preferential taxes, and preferential subsidies. Government can prohibit certain activities, or only permit them to a limited degree or under limited conditions. Government can tax "bad goods" more, and "good goods" less. Government can pay individuals or companies to do particular things and not to do other things.

In the past few years, the regulatory toolkit has expanded to include ***tradable permits,*** which use a market to control negative externalities or provide public goods. Sulfur dioxide emissions are being reduced by giving permits to polluting industries that authorize a certain volume of emissions. Over time, the volume of emissions is

reduced by reducing the number of permits. Industries have a choice to invest in reducing their emissions, in which case they have permits to sell, or to buy permits for their emissions at a price determined by the market. Tradable permits have led to a more rapid reduction in sulfur emissions at lower cost than most analysts expected.

Tradable permits for renewable energy, which were a by-product of restructuring the wholesale markets in the electric power industry, can now be purchased by retail customers to "green" the source of the electricity they use.

Unintended Consequences. Policy interventions have often led to unexpected results. Some are beneficial and others are detrimental. The logic of supply and demand in the marketplace is powerful. Like a flood or lava flow, it overwhelms or bypasses all obstacles, often in ways that would have been difficult to predict in advance. Rent control tends over time to reduce the quality and availability of apartments, increasing the homelessness it was designed to reduce. The Internet, originally created to maintain emergency communications after a nuclear war and to facilitate communication among academic researchers, has become an engine for market exchanges. Mandating higher fuel efficiency for automobiles has turned exempted "commercial" trucks into gas-guzzling SUVs. Mandatory recycling has spawned a host of new products.

Cost-Benefit Analysis. Cost-benefit analysis, sometimes called benefit-cost analysis, is a process of weighing costs against benefits as potential outcomes of a particular action or policy. It can help individuals and policymakers in business and government reach prudent decisions. It is one of the most useful tools of micro-analysis.

The *National Environmental Policy Act of 1969* requires the filing of an *Environmental Impact Statement* for all "proposals and other major Federal actions significantly affecting the quality of the human environment." Since the Reagan presidency, the Office of Management and Budget has required all federal agencies to consider "to the extent permitted by law" the economic impact of their actions and to choose the policy alternative "involving the least net costs to society."

In theory, environmental or economic impact statements bring together all of the relevant quantitative and qualitative data for proposed actions, and may involve a degree of mathematical precision. They can allow policymakers to assess the relative importance of each dimension and to consider the implications of alternative value systems. In practice, however, public policy makers can be overwhelmed by the undigested nature of the material, and interested parties often focus less on the content of the statements than on the procedural fairness or unfairness behind their drafting. Frequently, decision makers skip to the results of the cost-benefit analysis that usually accompany an environmental or economic impact statement without giving much attention to the details of the assumptions or calculations on which the results are based.

Cost-benefit analysis makes assumptions about the efficiency of markets, the significance of various non-market (externalized) costs, and the monetary values assigned to these costs. It often includes calculations of the risk of accident, disease or death. It usually adjusts, or discounts, future monetary values. The discount rates that are used make a huge difference in the dollar amounts assigned to future costs and benefits. The assumptions may be derived from empirical data, but the conclusions are determined by the assumptions. Anything entered into the analysis must be measured in quantitative terms, but the claim sometimes made that cost-benefit analysis is *objective* is not accurate. It is a combination of normative and positive analysis.

Cost-benefit analysis can help assess regulatory policy priorities. It is obvious that unvented space heaters should be regulated. This regulation saves approximately 63,000 lives a year in the United States at a cost of less than $100,000 per life saved. In contrast, the EPA rejected proposed regulations for benzene/maleic anhydride where the projected cost per life saved was $820 million. A regulatory process that identifies beach sand as a likely carcinogen before it evaluates the health effects of widely used carpeting adhesives has its priorities wrong, and would gain from cost-benefit analysis. A political process that fails to control the most egregious factors contributing to global warming or ozone depletion, in spite of the conclusions from cost-benefit analysis, is even more flawed.

Meeting our spiritually-based stewardship obligations requires both good individual choices and good policy choices.

Most cost-benefit studies contain substantial errors. Both industry and government forecasts tend to overestimate the cost of complying with environmental regulations; they take too little account of human ingenuity and technological innovation. Advocates for regulatory policies tend to overestimate the quantifiable benefits of their proposals. For many environmental problems, however, the conclusions from all but the most biased calculations are not even close calls. The harm to societal well-being from most unregulated market failures vastly exceeds the costs of controlling them.

Conclusion

When markets function well, they do a good job of exchanging goods and services for a large, diverse population. However, a number of failures interfere with the efficiency of market exchange, with damaging consequences for society and the environment. Community action and government policies are the only ways to correct most market failures. Yet nothing ensures that political processes will yield outcomes that protect people and the planet.

Positive analysis of markets, blended with an understanding of normative policy desires, can help correct market failures. There is irony, on the one hand, that micro-analysis identifies an essential role for government to correct for market failures. On the other hand, the micro-economist's focus on the benefits of markets is often used as a blanket rationale by those who oppose government regulations.

Meeting our spiritually-based stewardship obligations requires both good individual choices and good policy choices. Positive micro-analysis seeks to describe the characteristics of the marketplace. Friends need to use its findings to understand "what we want" out of a future economy — an economy that does not debase and threaten the whole of the global eco-system. Many tools exist to reshape the marketplace to be more ecologically sound and socially just. How can we encourage the use of the economists' tools in these ways? ♦

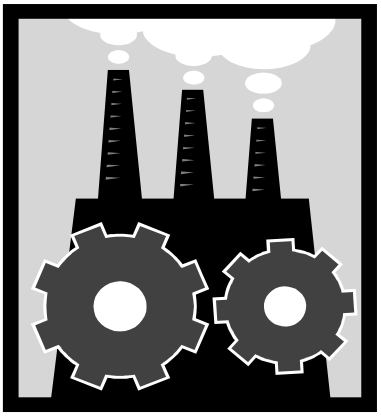
[1] Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations*, (London: Methuen and Company, Ltd., 1904), first published 1776

INDUSTRIAL ECONOMIES AS SYSTEMS

by Ed Dreby and Margaret Mansfield

Introduction

Why are there unsustainable trends in industrial economies? Two such trends are concentrations of wealth and disruptions of ecosystems. Microeconomics focuses only on markets. It separates the descriptive "what is" consideration of how markets allocate resources to meet consumer demand from the ethical or normative issues of how costs and benefits ought to be distributed within the society. It describes the systematic degradation of the ecosystem as an externality. If economic activities create inequitable distribution and damage ecosystems, it is because public policy has not corrected ***market failures*** of excessive negative externalities and market concentration.



Macroeconomics, the other branch of modern economics, considers how all the elements of an industrial economy interact to affect the overall level of economic activity. While inadequate policy may provide an explanation of specific environmental problems, there are also systemic features of continually expanding industrial economies that affect trends toward concentration of wealth and detrimental effects on ecosystems.

Throughout the history of market-based economies there have been periods of stability, of boom, and of bust. Explanations about why this happened involve money, banking, the weather, new inventions, new infrastructure, various business practices, and speculation. The most severe of these busts was the Great Depression of the 1930s. Macro-analysis developed from efforts to understand what caused it, why it lasted so long, and how to avoid a similar collapse in the future.

Macro-analysis begins with two basic insights about the way market economies functions. The first is that the relationship between savings and investment is a key determinant of the overall level of economic activity. The second is that a market system has many positive feedback mechanisms that accentuate tendencies to expand or contract, and lacks internal negative feedback mechanisms to provide stability.

Savings and Investment: Why Do Modern Economies Tend to Expand?

There are many explanations for the expansion of industrial economies and the sense that prosperity is at risk if they don't expand. There is controversy among economists about the usefulness of various explanations. But there is a reason that is basic to the system itself: the relationship of savings and investment.

When people decide to save part of their income instead of spending it for goods and services, the income saved is temporarily withheld from markets. To the degree that savings are withdrawn from the circular flow, as if kept in a safe-deposit box, the money in circulation is reduced and the demand for goods and services is apt to decline.

Savings can be returned to the circular flow in one of two ways. They may be used in financial markets to help support new investment. Or they may be deposited in a bank to earn interest, in which case they are apt to be loaned by the bank to someone else, and then be returned to the circular flow by the borrower.

To the degree that borrowers use loans for ***consumption***, the level of demand will be sus-

tained, and the borrowers will have to increase their future economic activity to earn enough money to repay the loan plus interest. To the degree that borrowers are businesses using loans to ***invest*** in new capital or to expand production, they too will sustain the overall level of demand. More investment and production is also apt to increase economic activity by increasing employment and consequently household income with which to purchase the increased production. In either case, to the degree that one person's savings are borrowed and spent by someone else, economic activity is apt to expand.

If, in the aggregate, savings are being underutilized for consumption and investment, this may reduce overall spending. If there is not enough spending to buy the goods and services that businesses produce or plan to produce, businesses are apt to reduce employment. This in turn is apt to further reduce household spending, and a downward cycle may begin. The main reason governments encourage businesses to borrow for investment, and consumers to borrow for consumption, is to prevent a recession.

Positive and Negative Feedbacks

The second insight of macro-analysis is that modern industrial economies contain many ***positive feedback*** mechanisms, and lack ***negative feedback*** mechanisms. The language of positive and negative feedbacks in system analysis can be somewhat counterintuitive because positive feedbacks do not necessarily lead to what we might regard as positive outcomes. There are many systemic elements of industrial economies that have the potential to create positive feedback that harm society. These include:

- trends toward the concentration of market share and wealth, i.e. concentrated wealth tends to beget more concentrated wealth which can corrupt the political system;
- a tendency for production, consumption and investment to grow beyond the ability of society to sustain the use of its goods and services, followed by a retreat into recession and stagnation;
- the expansion or contraction of the money supply as there are increases or decreases in aggregate debt; and
- the nature of speculative financial markets, that people's exuberance keeps stock prices rising and their pessimism that keeps stock prices falling.

Economists disagree about which of these are most influential in creating instability, but it is now widely understood that because of positive feedbacks, continual expansion seems necessary to maintain prosperity, and that without regulatory intervention the system is inherently unstable.

The Market Failure of Insufficient Demand

Businesses invest because of perceived opportunities to increase profits. This can be for several possible reasons. Consumer demand for a particular product, or demand in general, may be high. A new technology or organizational strategy may provide ways to lower costs of existing products. A new idea, design, or invention may create new products. Increased investment increases employment and therefore household income and consumer demand.

If businesses want to increase their borrowing, an increase in interest rates is apt to provide more money from households for this purpose. As prosperous times continue, a winner-take-all type marketplace may increase the concentration of income and wealth. In general, wealthier households tend to save a larger proportion of their income than non-wealthy households.

If income becomes more skewed toward wealthy households, the overall level of saving is apt to increase relative to consumer spending,

and the ***failure of insufficient demand***, a decline in consumer spending, may begin to occur. The propensity to save also increases when households feel less economically secure. Savings may increase and spending decline if there are concerns about losing jobs. This is the Paradox of Saving: that in hard times, more savings will worsen an economic recession.

If spending declines, business inventories will increase. While this is happening, most businesses are not apt to invest no matter how low the interest rate drops. The positive feedback that sustained economic expansion may switch to a positive feedback that sustains economic contraction. Less borrowing occurs. Less money circulates, and businesses cut production. Households earn less and have less money to spend. A "vicious cycle" of economic decline may take hold. This is a classic Keynesian recession.

The goals of macro-analysis are to minimize unemployment and inflation — the role of the government is central.

Macro-Analysis and Public Policy

Macro-analysis originated in the theories developed by British economist John Maynard Keynes to explain the causes and characteristics of the 1930s Great Depression. Its goals are to minimize both unemployment and inflation. Keynesian macro-analysis guided government policy from the 1940s to the 1970s, and it remains influential today.

In macro-economic analysis there is agreement on the goal of maintaining economic prosperity, and there is an assumption that sustaining economic prosperity means sustaining economic expansion. The role of government in shaping the economy is understood to be central. Positive macro-analysis considers how three elements interact to determine the overall level of economic activity: these are:

- private sector spending including consumer spending, business investment, and the financial markets;
- government taxation, spending, and debt for public-sector consumption and investment; and
- the money supply and interest rates.

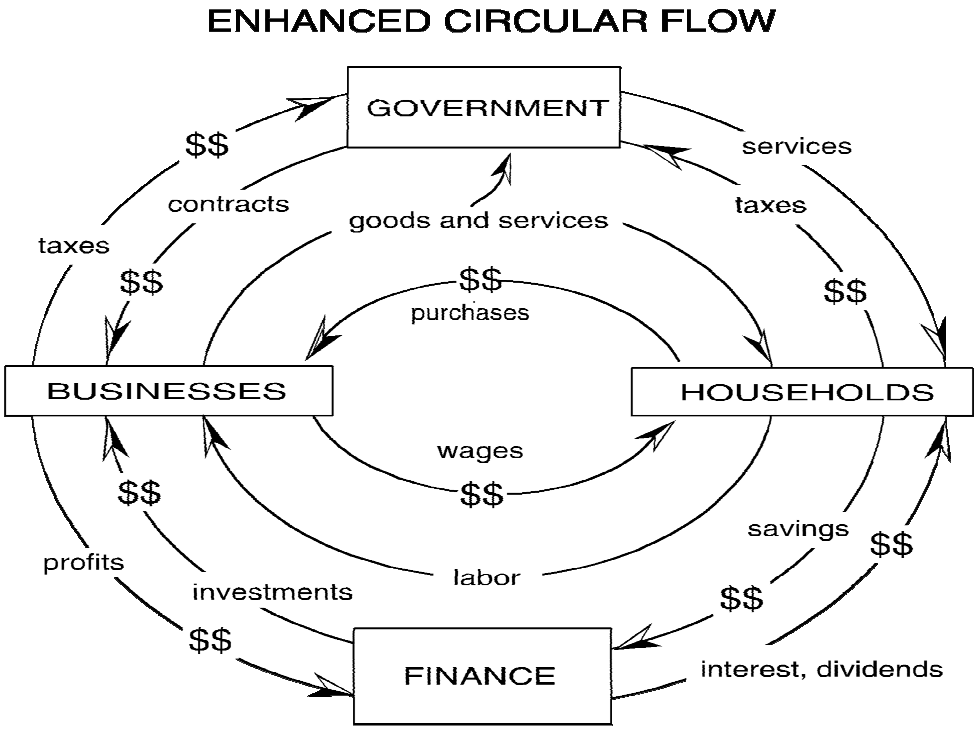
These interactions include the following:

- Employment depends on the level of consumer demand, which is affected by household income, and on the level of business investment.
- Business investment is affected by perceived opportunities for profit and by interest rates.
- How much, from whom, and in what ways taxes are raised affects household spending and savings, business investment and production, and profits from financial speculation.
- How much and in what ways government spends for public consumption and investment affects overall demand, employment, public debt, interest rates, and the money supply.
- Government monetary policy affects all of the above by influencing the level of aggregate spending, investment, and debt through increasing or deceasing the money supply and interest rates.

However, there is no agreement among economists about an ethically neutral role for government in the economy. Macro-analysis deals primarily with public policy, and policy issues are viewed as normative.

Four Policy Orientations

Within what has been termed the "Washington Consensus," two normative orientations predominate: a Neo-Keynesian orientation,



and a Neo-liberal/Monetarist orientation. Two alternative orientations also seem essential to consider in the context of Friends testimonies and concerns about the human-earth relationship: a Neo-Marxist orientation and an Ecological orientation.

Keynesian Orientation. This is an activist perspective regarding the role of government. It originated with the theories developed by Keynes, and proposes that government should intentionally use fiscal and monetary policy to act as a ***countervailing force*** to balance the problems induced by positive feedback of unregulated markets. Specifically, government spending for consumption and investment, and the redistribution of income and wealth through taxation, should be designed to maintain consumer demand, growth of income, and full employment. Keynesian policies are based on the following general ideas:

- If employment and private sector spending is too low, the government should decrease taxes to increase private spending, and increase government debt so as to increase government spending.
- If there is already full employment and private sector spending is high enough to cause inflation, government should reduce its spending and raise taxes to moderate overall spending, which also reduces government debt.
- Taxation should be used to redistribute wealth so as to prevent the failure of insufficient demand;
- Monetary policy should give priority to promoting high employment through lower interest rates.

The Neo-Keynesian orientation attributes the sustained period of economic prosperity from the end of World War II to the Vietnam War to the successful implementation of its theories, and has refined some earlier views in the context of more recent experience.

Neo-Liberal/Monetarist Orientation. This is a minimalist orientation toward the government's role in economic management. The monetarist perspective developed from the work of Milton Friedman and his colleagues at the University of Chicago in the 1960s, and rejects the view that post-World War II prosperity was due to govern-

ment policy. It sees government intervention as too cumbersome to be timely, and holds that because cutting taxes is always easier than raising them, Keynesian policies simply increase government debt. It also holds that government intervention inexorably leads to larger, less efficient, and more intrusive government. The main thrust of the neo-liberal perspective is to minimize the role of government in the economy as a matter of principle. Specifically, these perspectives hold that government should:

- limit its role in managing the economy to providing, through the Federal Reserve System, for a stable money supply and appropriate short-term interest rates, and
- set tax and spending policies on the basis of its legitimate and limited needs, and allow markets to determine the level of employment and distribution of wealth as long as the money supply is stable.

The monetarists attribute the success of the Federal Reserve in controlling the inflation of the 1970s, and the economic recovery during the Reagan administration, to their policies.

Neo-Marxist Orientation. This modern interventionist perspective on the role of government represents a re-thinking of Marx's critique of the inherent characteristics of capitalism. Neo-Marxist analyses of the economy are concerned with the roles of labor and of marginalized peoples, that is, the problem of poorer people in a sea of affluence. Because of a pro-market orientation of academic economics in the United States, a neo-Marxist orientation has more standing in the fields of sociology and anthropology, and with economists elsewhere. It focuses on

- an underlying ***dynamic of exploitation*** in markets of weaker interests by the profit-seeking of more powerful interests, rather than one of voluntary exchange among equals;
- the tendencies for wealth to accumulate, for profitability to be the single driving engine of the economy, for the powerful to minimize regulations and taxes, and for wages and benefits to be as low as possible;
- the need for public policy to provide ***rational oversight of private investment*** and for public investment in science and technology to assure that the general welfare takes priority over profit-seeking; and
- the need for stable social management of the economy so that the problems of market-driven positive feedback effects do not drive the economy into regular recessions.

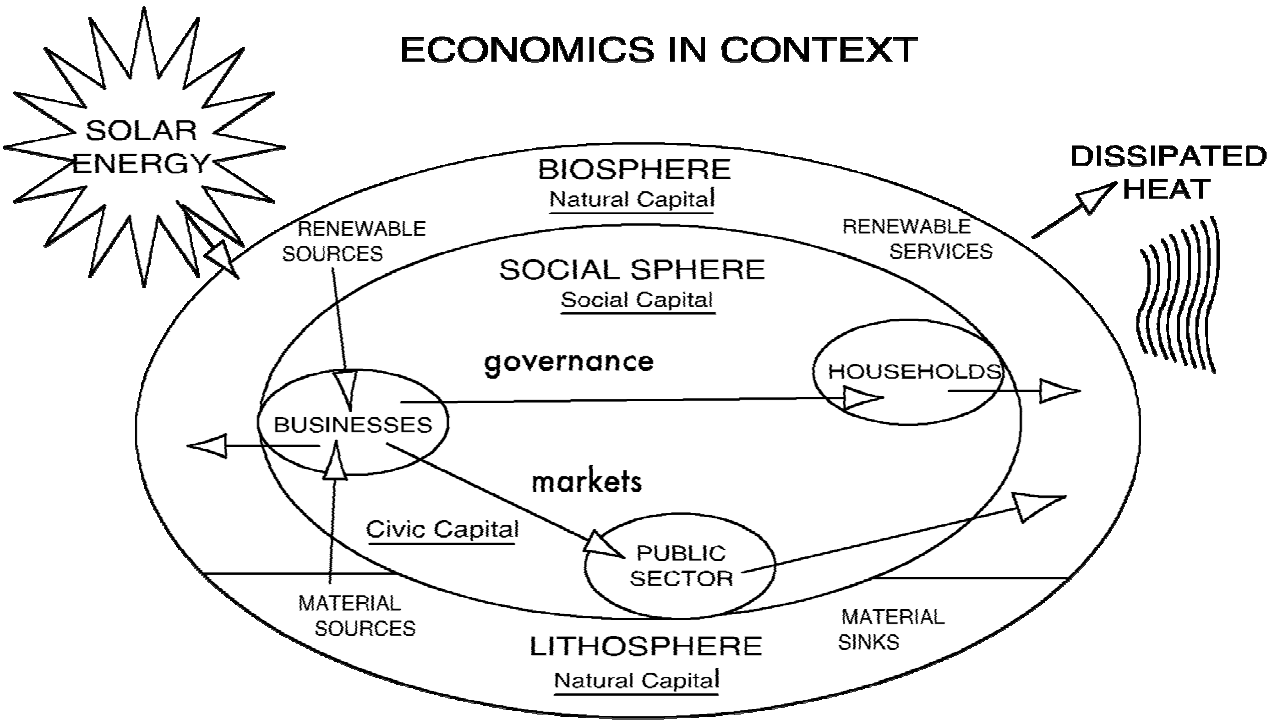
A Neo-Marxist orientation regards labor as the source of real wealth, and advocates for heavy taxation of financial wealth, and for government intervention to provide everyone with income security, health care, education and employment opportunity.

Ecological Orientation. This interventionist perspective focuses especially on the role of ***natural capital*** in sustaining economic production, and ***social capital*** as having an essential role as well. Ecological economists hold that conventional economics, as manifested by the use of GNP as the measure of prosperity, is flawed because it doesn't account for the full costs of goods and services, and because it treats the depletion of natural capital and expenditures to correct for market failures, as income rather than as expenses. That is, it does not measure real human well-being. Ecological economists see a need, at regional, national and global levels, for

- major investments in restoring and increasing the productivity of natural capital;
- including as a ***cost*** of using non-renewable resources the development of materials from renewable sources to replace them; and
- market mechanisms that provide feedbacks to establish and maintain ecologically sustainable limits to energy and material throughput.

The logical conclusions of ecologically oriented analysis are that

- the physical expansion of human economies in terms of material wealth will sooner or later end,



- renewable throughput must not exceed the earth's sustainable yield and restorative capacities,
- the use of non-renewable raw materials, such as metals, minerals, and fossil fuels, must be minimized,
- the energy throughput of human economies must come primarily from renewal sources,
- the concepts of capital, efficiency, and productivity, must be redefined to place economic activities in a context of ecological process, and
- economic and social incentives must reward choices that restore, protect, and enhance Earth's biological productivity.

To date, this view has received greater support from non-economists than from economists.

Why Do So Many People Think That All Economies Have to Expand?

It would certainly be possible to devise economic policies so that savings can be used for investment and other purposes without driving economic expansion. Even though globalization has linked all economies, many national economies use their resources for quite different purposes. Every modern economy uses a variety of ways to make four basic types of decisions that determine how it functions. In reality, every modern economy is distinctive and constantly changing in the ways it makes these decisions.

How much labor, capital, and resources from land are used to produce how much of what kinds of goods and service?

Three interacting ways can be readily distinguished:

- by markets, i.e., by voluntary exchange,
- by economic planning, e.g., by public agencies, corporations, and non-governmental organizations, and
- by unintended side-effects of other societal decisions, e.g., by executive, legislative, judicial, or non-governmental decisions made for other reasons.

Who owns and profits from the earth's natural capital and society's manufactured and financial capital?

Three general forms can be readily distinguished:

- Rent from ownership of land-based capital;
- Profit and interest from service- and manufacturing-based capital;
- Income flows from cooperatives, publicly owned, and not-for-profit business.

How is money created and managed?

Three ways, among others, can be distinguished:

- Money is created, and the supply is determined, directly by governments.
- Money is created by debt through the banking system, and the supply is managed through a central bank, called the Federal Reserve System in the US,
- Money is created in communities, by custom which is undoubtedly how money originated, or by design as is now occurring in many places with the development of local currencies.

How are decisions made about the economy's legal framework and management?

These can be made at different levels, in different ways, and for different purposes, as in:

- at the community, regional, national, or global level;
- by executive, administrative, judicial, legislative or electoral process; and
- based on priorities involving considerations such as
  a) interests of financial investors, producers, employees, consumers;
  b) differences in taxpayer income, age, and responsibility; and
  c) protection of public health and earth process.

By identifying these components and the complexity within them, we un-bundle a whole set of considerations that often come wrapped in a single package. At the present time, every nation's government has policies that affect the distribution of income and wealth. Some policies accentuate the tendency for the wealthy to become wealthier. Others moderate this tendency or may even counter-balance it.

We need to apply this understanding to the way economies relate to the earth. In small pieces we know how to reduce environmental damage. But overall, governments, international organizations and corporations have not been able to establish a vision of an economy that functions in harmony with nature. The commitment to promoting economic growth in order to create more money and material wealth as an end it itself seems insurmountable.

Furthermore, in a globalized economy, no single nation, no local government or organization, or no small business entity would be apt to succeed in truly redesigning its economy to function within ecological limits. We tend to think about the economy as illustrated by the Circular Flow Diagram. The earth is simply missing from this model. All it shows are the markets, as though milk comes from the super market and material resources come from, to use Boulding's phrase, an illimitable earth.

Unbundling the components of an economic system helps to identify possibilities, which is an essential first step for transforming the system so it can function prosperously within ecological limits. ♦

MONEY, BANKING, AND FINANCE

by Ed Dreby, assisted by Keith Helmuth and Gary Lapreziosa

Money was certainly one of humanity's pivotal inventions. Like language, and technical inventions such as agriculture, architecture, and metallurgy, the use of money and other legal forms of wealth evolved through practice over time rather than by design. Throughout history money has existed in many forms with differing systemic qualities, but efforts to understand the nature of money and the way it works have been rather recent. These efforts may be seen as falling within a range between two contrasting perspectives.

One perspective, most often encountered in economics textbooks, is that money and other financial instruments are ethically neutral tools that have evolved to reduce the costs of economic transactions. In this view, money has little effect beyond enabling individuals and communities to meet their needs and wants more effectively than would be possible otherwise. From this perspective, money simply facilitates exchange. Banking and finance should be studied as market phenomena that affect how economies allocate and distribute goods and services, which includes the ability of one party to use another party's savings.

The other perspective is that money is an integral and influential part of any complex society's economic system. In this view, the form money takes in a particular society has significant psycho-social and ethical effects. This perspective holds that systemic features of our monetary and financial structures play a key role in driving indiscriminate economic expansion, intensifying competition, and concentrating income and wealth. Its proponents think that re-designing the monetary system would have important and far-reaching social and ethical, as well as economic effects.

An important question for those concerned with right sharing of the earth's bounty and protecting the earth's life nurturing capacities is whether today's global monetary system is a significant factor affecting these issues directly, or simply a reflection of other determining factors. Can a more just and ecologically viable society be created using the existing system of money and finance? Are there features of the monetary system that need to change in order to make a more just and ecologically viable society possible? If so, how can the monetary system be changed to accomplish these ends?

Money: What Is It?

Money is a social institution, or convention, that provides a common basis for exchange in markets. Money can be anything that everyone is willing to accept in exchange for everything else. Money also serves as a "unit of account" to compare the value of different things, and as a "store of value," which means that people can save it to use later or simply to accumulate buying power. In principle, any durable commodity or financial claim could serve as money. But as economies have evolved, money has increasing taken on more liquid forms, i.e., forms that can be more easily exchanged for one another, or for goods, services, property, or contracts.

Historically, money has been created in two ways:

Customary money (like cigarettes and bank checks) is created by the community of people who use it.

Fiat money is created by the decree of an authority. Fiat money becomes legal tender if it is specified by a legal system for paying fines and debts.

Money has typically taken two forms:

Commodity money (like tobacco, grain, or fur pelts) has useful value in addition to its exchange value. Accumulating commodity money involves accumulating real wealth as well as exchange value.

Token money (like paper bills, bank checks and most modern coinage) only has value as a medium of exchange. Accumulating token money does not accumulate real wealth, only claims to existing or future real wealth.

The Value of Money

Token money's value depends on a) the willingness of people to use it in exchange, b) the amount of money that exists in relation to the volume of the goods and services that are being exchanged, and c) the ease with which goods, services, and other financial instruments can be exchanged for it. As long as there is a stable ratio, or balance, between the amount of money in circulation and the volume and rate of goods and services being exchanged, market prices will be relatively stable and will reflect the relative value of one good or service to another.

If more money enters the system relative to the volume and rate of goods and services being exchanged, then over time prices will tend to rise and the value of the money will become less. This is what is meant by **inflation.** In times of inflation, money tends to lose its usefulness as a store of value.

If the money supply is reduced so the ratio of money to goods and services changes in the other direction, then theoretically prices will go down (deflation). More commonly, reductions in the money supply have tended to reduce or depress the level of economic activity. This is one cause of a **recession.**

The Evolution of Money

Money probably evolved from barter as customary commodity money. Sumerian civilization used standard weights (shekels and talents in Semitic languages) of various commodities as money. King Croesus of Lydia, successor to King Midas of the golden touch, is identified with the invention of coinage, the earliest known form of fiat money. Initially, coinage was also an efficient form of commodity money because the king's seal guaranteed the value, i.e., weight, of the coin.

Paper money seems to have originated in China. It probably came into use when receipts for commodities in storage began to be used in trade because it was easier to leave the commodity in storage, in the safe-keeping of a merchant, government, or temple, and to exchange the receipts rather than the commodity itself. Paper money may or may not be fiat money, and may or may not be able to be exchanged for commodity money or coinage.

Currency is the form of money currently in use in a particular society or community. In most contemporary economies, the most widely used form of money is a national currency: bills and coins printed and minted by the government, which are also referred to as base money. Some communities use local currencies in addition to the national currency. Historically, gold and silver coins were what most people recognized as "real money" because the exchange value of coinage was supported by its use value as a precious metal. Modern base money is token money because the value of paper bills and of most coinage has no relationship to the use value of the paper and metals from which they are made.

While modern money typically takes the form of national currencies, banking systems rather than governments create most of it. A bank creates "bank money" when it issues paper notes or checks. The value of bank money used to depend on the ability of the banks to exchange their notes, or cash their checks for "hard money," which meant gold or silver coins. In the U.S. since the 1930s, however, bank checks have been regarded as "real money" because the federal government a) ended the connection between a dollar and a fixed amount of gold or silver; b) insured bank deposits except in very large amounts, and will produce as much currency as is needed to enable most depositors to "get their money out of the bank"; and c) requires that many payments be made by check rather than in currency.

We are accustomed to thinking of a bank check as a piece of paper that directs the bank to make a payment from one account to another account. Increasingly, this process of transferring funds is taking the form of an electronic rather than a paper transaction, one that occurs, or "clears," in seconds rather than in days.

Money and Banking

Modern banking evolved in 17th century England. In 1640, King Charles was short of money so he confiscated the gold that some of his subjects had deposited for safe keeping in the Tower of London. This prompted many of the king's other subjects to deposit their gold with London goldsmiths, who also offered a service of safe-keeping for gold.

The goldsmiths gave the depositors receipts for gold, and paid 5% interest with the understanding that they could lend the money out to others. They made these loans by issuing still more receipts, or notes, instead of gold. The goldsmiths knew it was more convenient for their customers to transact business with the notes rather than by withdrawing gold from deposit, so the notes came to serve as money. Only a few people redeemed their notes for gold at any one time, so the goldsmiths could easily make loans beyond the value of the gold in their vault or safe, and make money for themselves from the interest they charged for the loans.

In 1694, King William needed money to finance a war, so he used the example of the London goldsmiths and chartered the Bank of England to handle the royal debt. Wealthy people were invited to invest 1,200,000 pounds in gold to become shareholders, which the Bank loaned in the form of notes to the government at 8% interest. This was profitable for the Bank's shareholders. The government also allowed the bank to produce additional notes equivalent to the same 1,200,000 pounds and lend them to other customers. This meant the money was loaned twice, and an equivalent amount of new money in the form of bank notes was created. It gave legal status to the practice of fractional reserve banking, which is the basis of modern banking.

Money and Banking in the United States' Early Years

In the colonial period, legal tender was the British pound sterling in the form of gold and silver coins. British bank notes were theoretically backed by gold or silver coinage, and could be exchanged for "hard money" in the form of coins. Mercantile policy led the British government and other European governments to accumulate gold and silver within their own country, and British policy outlawed the creation of banks in the colonies. This meant that hard money and bank notes were scarce in the colonies, and many forms of commodity money

developed. Colonists also used wampum, customary token money made from shells, a practice that had evolved among the native American cultures.

During the Revolutionary War, the Continental Congress used un-backed paper notes as legal tender to finance the war. Because so much money was printed, there was massive inflation. Some historians believe this was due at least in part to a British tactic of printing and circulating counterfeit notes to disrupt the colonial economy. In any case, by the end of the war, the bills printed by the Congress "weren't worth a continental."

The U. S. Constitution gave the federal government sole authority to create legal currency. This was done because under the Articles of Confederation, state governments created their own money, a practice that became a major obstacle to inter-state commerce. For much of U.S. history, the national currency consisted of gold and silver coins, also referred to as "specie." Gold and silver coins of other nations also served as legal tender for much of the 19th century.

As banks were created in the new nation, they printed and distributed bank notes that people were willing to use as dollars only as long as they believed the bank was able to exchange them for gold or silver coins. The exchange value of bank notes for use in commerce and daily life depended both on the bank's reputation for being able to deliver specie on demand, and on the distance to be traveled to exchange the notes for hard money. Distance was a factor because no bank was required to redeem another bank's notes.

During the Civil War, the Union issued paper "greenbacks" that remained valuable because the quantity was limited and the government said they would be convertible to gold at a later time. The Confederacy printed paper money in large quantities which soon created hyper-inflation and, like "continentals," became worthless.

As a result, conventional wisdom in the eastern financial establishment saw gold as the only foundation for a sound monetary system. In contrast, many southerners and westerners, particularly farmers and other debtors, favored "easy money" policies, i.e., inflating the money supply by issuing greenbacks or increasing the use of silver, to raise prices and wages so it would be easier to borrow money and pay debts.

This conflict culminated in the nomination and then the defeat of "free silver" advocate William Jennings Bryan in 1896. Yet it was the expansion of the money supply by the banking system, not restrictions on the money supply due to a limited supply of gold, that enabled the U.S. economy to develop as rapidly as it did. How and why was this the case? How has the monetary system changed in the 20th century?

Money and Fractional Reserve Banking

Banks make loans by giving borrowers a line of credit against which they can write checks. Banks are able do this because they know that most depositors leave their money in the bank most of the time. The banks only need a fraction of the money deposited with them as a reserve to cover cash withdrawals (hence ***fractional reserve***). They use the rest to make loans on which they make a profit by charging interest. When a recipient of a bank check deposits the check in an account rather than cashing it, new money in the form of a new deposit is created. The bank can then make additional loans based on this new deposit. This process by which banks create money is also referred to as ***deposit creation.***

Reserve ratio: this is the fraction, or percentage, of its deposits that a bank does not lend, but keeps available to cover withdrawals of deposits.

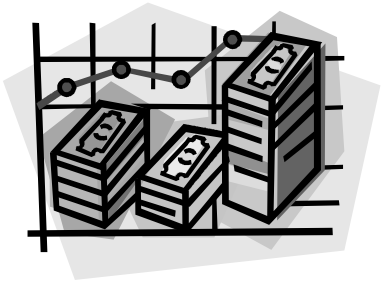
***Reserve requirement*:** this is the fraction of deposits that a government requires the banks it charters to maintain as cash reserves.

***Multiplier effect*:** this is the increase of the total money supply as checks based on bank loans circulate through the economy and are deposited the banking system to create new "bank" money. There is also a reverse multiplier effect that reduces the money supply when loans are repaid unless new loans are made. In theory, the multiplier effect can be as high as the reciprocal of the reserve ratio/requirement.

***Collateral*:** this is property pledged as security for the repayment of a loan. Most banks require some form of collateral to secure many of their loans. Credit cards are a means by which the banking system makes many unsecured loans.

Benefits and Risks of Fractional Reserve Banking

Fractional reserve banking has played a key role, along with science and technology, in creating the advances in health, affluence, and cultural achievements attained by industrialized societies. When banks use new deposits to make loans, as long as the borrowed money is invested in new productivity, new real value is created that corresponds to the new money created by the multiplier effect.



This works wonders for the purpose of promoting new investment and economic growth. The process continues as long as a) borrowers are able to repay their loans with interest; b) when loans are repaid, banks are able to re-loan the money to other borrowers so that the money supply is not reduced by a reduction in the volume of debt; and c) there is eventually enough increase in the base money supply to sustain the increase in bank money. The interest that banks charge pays for the services they provide and yields a profit that promotes more growth.

However, difficulties arise if borrowers are unable to repay their loans, if banks are unable to maintain the aggregate volume of debt, or if there is insufficient increase in the base money supply. When a loan is repaid but there is no new loan to replace it, the bank money created by the original loan will simply disappear from the system. When loans are not repaid, banks cannot make new loans and must foreclose on mortgages or liquidate collateral (sell it for currency) in order to meet their obligations to their depositors. In either case, the money supply will be reduced, and the circular flows on which commerce and economic prosperity depend are at risk of being disrupted.

As U. S. industrialization increased, banks became increasingly important as a source of capital for farmers, industry and commerce. But they also contributed to cycles of economic boom and bust. When business was booming, banks were eager to increase their loans. When business slowed, banks became much more cautious about making loans. Thus, when private banks acted in their own best interests they tended to accentuate instabilities in the economy as a whole through the multiplier effect on the money supply.

There was also no coordinated way to prevent banks from failing when, periodically, depositors became afraid a bank would fail. Because many depositors tried to withdraw their money from a bank at the same time, they inevitably created the failure they feared. As a bank experiencing a "run" would try to withdraw currency from other banks, panic often spread to other banks as well.

Bank panics help to create and prolong major economic crises in 1837, 1857, 1873, and 1893. When panics occurred, prices fell, people couldn't pay off their loans, and banks foreclosed

on the homes or farms that had secured the loans. As a result, in 1914 Congress established a central banking system, a development that had already occurred in most other industrialized nations. This enhanced the benefits and reduced the risks in the U.S. of fractional reserve banking.

The Federal Reserve System and Monetary Policy

The Federal Reserve Act of 1914 established a central banking system to serve as a bank for the nation's private banks. Twelve regional ***Federal Reserve Banks*** were intended to be an arm of government, isolated from politics, that would serve the public interest by providing for the elasticity of the money supply and the liquidity of the banking system. Elasticity refers to the ability of the money supply to expand and contract as needed. Liquidity refers to a bank's ability to convert assets to currency in order to pay cash for their checks on demand.

The working capital, i.e., operating funds, of the Federal Reserve System (***the Fed***) was provided by a requirement that members banks deposit a portion of their reserves with the Fed (hence a ***reserve bank***) in return for which they could increase their liquidity by borrowing from the Fed's currency reserves. The Fed also provided a clearing house for checks drawn on individual accounts. As a result, personal checks soon came to replace bank notes as the main form of bank money.

Monetary policy refers to the tools available to the Fed for managing the elasticity of the money supply, i.e., increasing or decreasing the total amount of money in circulation. The Fed has three basic tools for doing this:

• changing the "reserve requirement" which is the fraction of a bank's total deposits it is legally required to keep a) on deposit with the Fed, and b) as a cash reserve in the bank;

• changing the "federal funds rate" formerly called the "rediscount rate," which is the interest rate the Fed charges on loans to member banks;

• "open market operations," the buying and selling of large, short-term government bonds.

By changing the reserve requirement the Fed can alter the dynamic of the multiplier effect in the entire banking system. By changing the interest rate on its loans to member banks, the Fed invites or discourages individual banks to borrow from it in order to increase their loans to customers. By buying or selling bonds the Fed decreases or increases its own cash reserves, thereby increasing or decreasing the currency in circulation.

Of these tools, changing the reserve requirement is the most drastic. The multiplier effect is the reciprocal of the reserve requirement, so a slight change in the reserve requirement can create a large change in the volume of bank money. Because the Fed's purpose is to provide monetary stability, open market operations, which are the least intrusive of its tools, became its predominant means of managing the money supply. In the 1920s and 1930s, bitter experience taught that drastic action usually made things worse.

New Deal Currency and Banking Reforms

Bitter experience also taught that a money supply backed by gold only worked well if the growth of the economy was paralleled by an increase in the gold supply. This tended to be the case during most of the 19th century. But as economic growth increased during the 20th century, the gold supply was heavily affected by international trade and finance. The increase in the gold supply could not keep pace with the speculative stock market boom of the 1920s that the Federal Reserve Banks fostered rather than dampened. The Federal Reserve System as initially conceived was able to provide

emergency liquidity for individual banks, but with an enlarged economic system and a speculative bubble based on a limited supply of gold, there was little it could do to prevent a "run" on the whole system.

One result of the bank failures during the Great Depression was a decision to eliminate the gold standard as the basis for the nation's currency. A second was to create the Federal Deposit Insurance Corporation. A third was to separate commercial banks from the financial markets, i.e., the stock and futures exchanges. And a fourth was to centralize the management of the Fed by giving the Board of Governors in Washington control over the nation's monetary policy, which meant effective control over the nation's currency supply.

A more fundamental result of the Great Depression for monetary policy was the analysis of its causes by John Maynard Keynes. Keynes and his disciples argued that monetary policy should be used in conjunction with fiscal policy (government spending and taxation) to moderate and at times to counteract the cyclical tendencies of economic activity to expand or contract.

1944 to 1971

At the end of World War II, the United States found itself in a strong position economically. It had an intact industrial capacity, and huge gold reserves that had been received in payment for supplying the wartime needs of other nations. Under the 1944 Bretton Woods agreements, the U.S. dollar became the currency of international trade, based on an international exchange rate of $35 per ounce of gold that was backed by U.S. gold reserves. All other currencies were valued in relationship to the US dollar.

For over 20 years, the U.S. money supply was managed by the Fed in accordance with Keynesian monetary theories. The central banks of other nations used similar tools to manage their money supplies in order to maintain the value of their currencies in relation to the US dollar. The effect was global monetary stability.

During the 1950s, Keynesians wanted to use fiscal policy to promote economic growth, and "fiscal conservatives" were opposed to government policies to promote growth because of the possibility that too much growth would destabilize the monetary system and create another depression. This was one of the policy issues in the Kennedy-Nixon presidential election.

Keynesian monetary and fiscal policy worked well until the Johnson and Nixon presidencies of the late 1960s and early 1970s. Over time an increasing number of dollars accumulated outside the U.S. that could theoretically be redeemed for a limited supply of gold. In the late 1960s, the U.S. Treasury faced a series of crises in the form of possible "runs" on the US gold supply. In 1971, the U.S. government decreed that it would no longer exchange dollars for gold.

How the Fed Influences the Money Supply

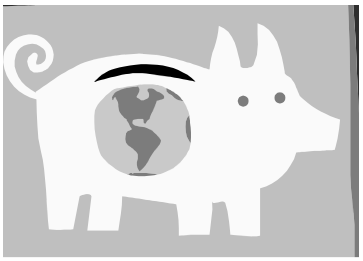
Before 1934, production of base money in the U.S. — coins and bills — was the responsibility of the Treasury Department, and treasury bills could be redeemed for gold. Many dollar bills were identified as "silver certificates" that could be exchanged for silver dollars. With the Banking Act of 1934, production of base money began to be shifted to the Fed that issued "federal reserve notes" which are "backed" by U.S. government bonds.

This enables the Fed, through its "open market operations" of buying and selling U.S. bonds — large short-term Treasury bills or T-bills — to increase or decrease the base money supply. T-bills, on which interest is paid by the government, are sold by the Treasury Department to private investors through the banking system and used to finance government operations.

To expand the money supply, the Fed buys T-bills through the banking system, and pays for them with dollar bills it has printed for this

purpose. To contract the money supply, the Fed sells its bonds, receives payment in dollar bills, and removes the dollars from circulation. Because of the multiplier effect of the banking system on the base money supply, the Fed's open market operations have a substantially larger effect on the overall money supply than the dollar amounts of its bond transactions.

The currency issued by the Fed through its open market operations is matched by equal amounts of T-bills that it, the Fed, holds in its reserves. Until 1971, the Treasury Department continued to issue some "debt-free" currency on which no interest was paid, but since that time, all U.S. currency has been backed by interest-bearing debt. Thus, all the currency produced by the Fed has its origin in U.S. government debt, and all bank money similarly originates in some form of debt. This means that borrowers, in order to pay back their debts, must produce and sell goods and services comparable in value, plus interest, to the money created by the Fed or the banking system



Recent Changes in the Global Financial Architecture

Since 1971, the values of all national currencies relative to each other have been determined by global currency exchange markets, and the global money supply is no longer tied to any real commodity. This has meant that the global money supply has been able to expand to keep pace with the expansion of the global economy. This, however, has also diminished the ability of national central banks, like the Fed, to manage domestic money supplies. As a result, central banks and international monetary institutions have been challenged to work cooperatively to develop a global monetary policy, a challenge not yet met in practice because large private global banks have effectively freed themselves from central banking control.

The monetary challenges facing the global community have been exacerbated by several recent trends:

- Innovations in computing and telecommunications have increased the ease by which virtually any financial investment can be exchanged for currency, blurring the distinction between money and other financial assets.
- Restrictions on financial transfers between countries have been eased and the United States has eliminated many of the legal distinctions between banks and other financial services corporations.
- Research in the mathematics of finance has yielded a host of new financial instruments that may be derived from a single source of expected future income. Using mathematical formulas to define relationships among options, futures, and various derivative products tends to amplify the impact of changes in one financial market on another.
- Powerful computers enable traders to exploit even tiny **arbitrage** opportunities (taking advantage of the discrepancy between the value of the same asset on different exchanges) for substantial financial gain.

In 1970 the dollar value of annual U.S. financial transactions was about twice the dollar value of the real U.S. economy. By the 1990s the financial economy had grown to between 20 and 50 times the size of the real economy. The outcomes were that:

- More than $800 billion was traded every day, of which about $25 billion was for trade in goods and services, and $725 billion was for trade of financial instruments;

- About half of the trade in financial instruments was for stocks and bonds which, like money, are claims to real wealth. The other half was for options, futures, and other derivatives, which are claims on claims to real wealth and have value only for speculation.

It has been estimated that the global money supply increased at least 10 times during the 1990s, and that it has become highly volatile, constantly increasing and decreasing by increasingly large amounts.

The increased size and liquidity of global financial instruments have proven to be a destabilizing force. Sudden "capital flight" has led to macroeconomic and foreign exchange crises involving Mexico, Russia, Argentina and the leading South Asian economies. Absent some form of collective countervailing factor, the size and volatility of global financial markets almost certainly increases global income inequality.

From the 1950s to the 1980s, income from interest grew from 1% of national income to 10%

Less clear are the implications of money, banking and the global financial system for the ecological integrity of our planet. Some policy professionals and analysts argue that the system necessarily imposes a growth bias that adds to pressure on finite and already stressed biosphere. Others see promise in harnessing global markets to share the costs of environmental protection and restoration. Some see a need for modest reforms, along the lines of the creation of the US Federal Reserve System in the 20th Century. Others see a need for fundamental changes in the design of the global monetary system.

Money Based on Interest-Bearing Debt: Characteristics and Questions

A system of debt-based money has several systemic characteristics. For every dollar that someone owns, someone else owes a dollar. This stimulates economic activity because the debt-holder must do something to pay back the debt, which helps to assure that the dollar has value. The fact that interest is owed means that in order to pay interest the debt-holder must actually earn more money than the amount of new money the debt itself creates (or the government must tax more than it spends in order to pay interest on its debt).

If the economy is expanding, debt-holders have reasonable prospects to increase their net worth sufficiently to pay interest and come out ahead. This is the essence of entrepreneurial risk-taking. If a debt-holder cannot use the borrowed funds to increase her or his net worth over time by at least double the amount paid in interest, the net effect is to increase the wealth of the lender compared with that of the borrower. When the economy and money supply are not expanding, debt-holders must earn money at someone else's expense to pay interest on their debts.

One of the questions Kenneth Boulding asked was how changes in the proportion of aggregate income coming from interest, profits, and wages would affect the rate of unemployment. He observed that when the percentage of interest income was high relative to profits, especially as in the 1930s, employment was low whether or not wages were high, and when the percentage of interest income was low relative to profits, employment tended to be high. He also observed toward the end of his life that aggregate income from interest was about 1% of national income in the 1950s and had grown to about 10% of national income in the 1980s. He suggested that considering the causes and effects of this shift was apt to be important for understanding many other changes occurring in the U.S. and the global economies.

In an "empty world" there are many opportunities to increase the economic throughput of markets so that everyone can become wealthier. A debt-based monetary system enhances these opportunities by creating financial capital to promote economic development and by enabling the money supply to expand as debt and throughput expands. As the world becomes "full," the pressures will increase to incorporate ever more resources and human activity into the market system so that borrowers can pay interest and still come out ahead. If an economy is not expanding, an effect of interest-bearing debt seems to be one of transferring wealth, or claims on future wealth, from borrowers to lenders.

How can our debt-based monetary system be adapted to serve the needs of our "spaceship economy"?

The current debt-based monetary system as it has evolved over the past century would appear to be an option within an array of possibilities. The U.S. government successfully issued debt-free greenbacks during and after the Civil War, and debt-free bills were still being issued by the Treasury as recently as 1971. Many communities throughout the world are successfully using local "complementary" currencies that are issued without debt.

As the world becomes more crowded, an important question becomes: How can the current debt-based monetary system be adapted to serve the needs of a "spaceship economy" in which economic through-put is restrained so as to remain within the productive capacity of the biosphere?

As with other challenges we face, resolving questions about the monetary system on which there is not agreement need not prevent us from taking actions around which virtually all of us can unite – including debt relief for the poorest nations, other strategies for redirecting a fair share of windfall financial returns for the collective good, "circuit breakers" to prevent panic selling on global financial exchanges, and ways to ensure that financial flows accurately reflect environmental harms as costs associated with the underlying economic activity. ♦

Seeds of Violence, Seeds of Hope

Volume I: The Reader

SECTION 3

WAYS FORWARD

The articles in this section describe work being done and opportunities to consider directed toward creating more ecologically integrated economies. Most of the articles focus on progress in providing needed goods and services with a smaller ecological footprint.

TOWARD AN ECOLOGICALLY INTEGRATED LIFE

by Susan Carlyle

Both the application of the Simplicity Testimony and living lightly on our planet are, to me, all about priorities and daily decisions. George Fox told us that in order to walk cheerfully, answering that of God in all beings, one must be a pattern and an example. This means making daily choices in the areas of food, transportation, work, money, time, home, and holidays. It means asking ourselves: What is important? Possessions? Money? Time for care of the soul? It may mean asking ourselves: Is this the best use of the world's resources?

Why should we ask such questions? Perhaps as a spiritual practice? As "right sharing"? As a means to make a smaller ecological footprint? Perhaps, it's for all of these reasons.

The first role models in my life were my parents. They taught me a healthy sense of priorities and gave me a spiritual base. My first college roommate was a Quaker. She was not the average coed/consumer and she taught me what it meant to live one's faith. Another role model in my life is my husband, Kim.

When Kim and I merged our lives in 1994, we had at least two of everything: two jobs, two cars, two houses and more. We started to realize that although we had plenty, what we really wanted was — less. We started scaling down by giving things away, spending more time at home reading, playing games, and bicycling. We had begun our marriage without a television, so we had plenty of time for talking with each other to compare dreams. We stopped eating meat. We went from two cars to one. We erected a clothesline in the yard. We began reviving old skills like making bread, wine, beer, and yogurt. We started cutting each other's hair!

Then came the home energy audit. That was an eye opener. We did research on solar technology and on independent homes and began planning. Could we do it? Could we live somewhere with no need for an electric bill or a water bill? Could we live where we could grow our own food for most of the year? Could we reduce our need for money such that we could quit our jobs and retire at age 50? What began as an ecological and economic exercise, we slowly began to realize was becoming a spiritual practice — that of mindfulness.

We moved from the Chicago area to the mountains of North Carolina. Our land has a good-quality spring 150 feet above the home site, providing gravity-fed water. We built a small, passive-solar house. We installed a solar hot-

water system and put photovoltaic panels on the roof to generate and supply our electricity.

That put us in a place to make some more decisions. Because there was no local trash pickup available in our rural community, we began our "no garbage" lifestyle. That meant thinking before buying, or better still, making or growing things instead of buying them. It meant minimizing the use of manufactured products to avoid the packaging and chemicals, and the trip to town to get them. We planted a large garden with lots of perennial vegetables like rhubarb, asparagus, and mushrooms. We planted things that we thought would store well in a cool place over the winter months (white and sweet potatoes, winter squash, onions, garlic, peppers, and herbs), and did a lot of preservation, that is, canning and drying fruits and vegetables. Berry bushes, grapevines, and fruit trees rounded out the food sources. We built a cold frame and a garden cloche so that we could grow greens throughout the winter.

Living this way makes one pay attention to the weather, not only for the garden, but for the presence of the sun that we depend on for electricity and hot water. It means being mindful of how much electricity we use when the sun is not shining. The water from our spring is what we use for washing clothes, bathing, cooking, and drinking. We need to be mindful during times of drought that this resource is not unlimited, by any means. Living this way points out the importance of having and maintaining good health.

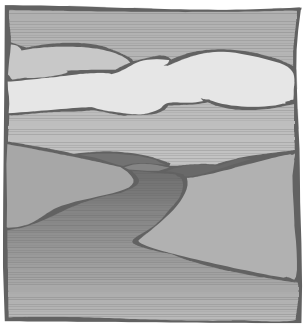
Some of the other changes that took place as a result of this lifestyle transformation were more gradual. We unplugged ourselves from the mass media and began relying on alternative publications for news of the outside world. We began giving tours to university students who were studying about energy or sustainability. We began building local community by sharing seeds or abundant produce, starting a food-buying cooperative, and carpooling. Just imagine what it would feel like to disconnect from the supermarket chain. It's a radical step, but one that feels so right. We know where our food comes from, and that it is free of pesticides and chemicals. We now purchase only the food we cannot grow, and buy it in bulk quantities through our local food co-op. We find that we dine out less often, and that we enjoy what is in season in our garden, or in storage in the pantry or root cellar.

Our efforts to curb our use of fossil fuel have also led to positive changes. Since we limit our trips to town, we have more time for homesteading activities, for inward retirement or reflection, and for friends and neighbors. Since we are forty miles away from our Monthly Meeting, we began a small worship group in our little community. We travel long distance by bicycle, Greyhound bus, or Amtrak trains. This often shocks our family and friends and sometimes requires an explanation. And we put ourselves, and our automobile, on a mileage budget with a trip log — a constant reminder to reduce the total miles driven in a year.

As a spiritual practice, we have begun regular Sabbath-keeping from sundown on Sixth-day until sundown on Seventh-day. We light a candle as a reminder that this day, especially, is for living lightly. It is a day for being especially mindful and less busy. It is a day for staying home, reading, doing things that we love to do or things that fill the spirit — sometimes even fasting. It's a day for connecting with each other.

Our biggest surprise has been the realization that our lives have become richer in all respects. We feel in tune with the natural world and have the time to enjoy the moments as they happen. Our lives lack the complexity of most, but we are more mindful of how we spend our time and our money, and of where our food comes from. Living this way is not always easy. It might be easier just to ignore the devastating effects of over-consumption in the world, such as the disappearance of species.

We all need to make changes, because our dependence upon fossil fuel requires our country to have a military presence around the world. We need to make changes because a major transformation in the way we live and the way we relate to the natural systems that support life is vital for a future that includes peace, justice, and happiness. I have described a path to living an ecologically integrated life. It does not matter where you are on the path. What matters is that you are on the path and are considering some changes to your own way of doing things. ♦



Here are some challenges for you (Some are easier than others):

Embrace silence daily
Connect with nature and the planet
Stay home and be less busy
Say "no" more often to requests for your energy and time
Drive less and advocate for better local transportation options
Give your car a "day off" each week
Be a non-consumer
Spend mindfully and locally
Give stuff away and have less to care for or insure
Eat food in season, grown locally
Convert a garden to organic
Unplug from the media
Share tools and seeds
Use less water
Buy energy-efficient appliances
Use non-toxic cleaning materials
Explore low-cost leisure such as hikes and potluck meals
Be alternative and radical and tell others why
Rethink wants and needs
Buy in bulk to minimize wasteful packaging
Use compact florescent bulbs in your home
Fix instead of replace
Examine all holiday practices to see if they are in line with your values
Reduce debts
Exercise daily at home — do yoga or aerobic activities

SUSTAINABLE AGRICULTURE

by Al Connor

Sustainable agriculture is a system of growing food and fiber that (1) provides safe and healthful food and fiber to an entire population; (2) allows the soil to renew its fertility and productivity, preserving it for future generations; (3) uses water, most of which is provided by precipitation, in ways that keep it clean and uncontaminated; and (4) sustains the local community by producing sustenance for its inhabitants at a reasonable cost, or in exchange for goods, farm labor, or services.

More than half of the food sold in supermarkets and grocery stores is produced on huge factory farms that are owned by food processing and distribution corporations or their contractors. Some small farmers also contract with agribusiness corporations, often because they have don't have access to other markets. But the restrictions imposed by the contract, especially on prices, often makes small farming a breakeven enterprise at best. For many, it's more profitable to sell their land to a developer or agribusiness corporation.

Factory farms that specialize in producing fruits and vegetables for our tables and for canneries, and grain for livestock feed and human consumption, use the least labor-intensive methods possible. The labor they do employ is paid the lowest wage possible. They manage weeds and insects with toxic, sometimes carcinogenic, pesticides. Huge four-wheel drive tractors and combines compact the soil and degrade its percolation and water retention capacities, thereby increasing the need for irrigation.

For every bushel of grain or produce grown on such farms in the United States, Mexico, Canada, Argentina, France, the United Kingdom, China, or anywhere in the world, acres of land are made less fertile. Tons of topsoil are eroded by wind or washed into rivers and streams. For every calorie of energy contained in a food product sold in a supermarket, at least two calories of fuel, mainly fossil fuel, have been required to produce it. The average item of food travels 1,500 miles from its source to the store where we buy it. That takes at least another ten calories of fossil fuel to get one calorie of food to us. Then the heat, light, and refrigeration in the store, and driving our car to and from the store, take even more calories to get just one calorie of food energy to our table.

Concentrated animal feeding operations (CAFOs) and industrialized dairies, i.e., milk factories, confine thousands of animals in a building or feed lot. The cattle, pigs, turkeys, or chickens never see the light of day. Disease is easily transferred among animals in such conditions, and so antibiotics are included in their

feed. Hormones to speed the rate of weight gain are also included in feed. The hormones and antibiotics can be transferred to humans who eat the meat or drink the milk of those animals. There is evidence that some people have become resistant to antibiotics, and that their resistance may be traced to food they have eaten.

Large livestock, dairy, and poultry factories produce and accumulate tons of manure and urine daily. One thousand cattle can produce as much waste as the inhabitants of a medium-sized town. The Environmental Protection Agency requires such factories to build large leak-proof lagoons for storage of animal waste, which is euphemistically called "nutrients." Many of the lagoons do leak, and many have overflowed during heavy rainstorms. Consequently, they have polluted rivers, streams, and aquifers with fecal matter, and *e coli* and other bacteria. The solid waste in the streams absorbs undissolved oxygen, stifling aquatic life. Ammonia from the lagoons evaporates and pollutes the air, causing much discomfort to nearby residents. Lagoons are supposed to be emptied frequently and their contents distributed to neighboring farms as soil nutrients. However, most lagoons produce more nutrients than the nearby small farms can utilize.

Industrialized, factory farming is not sustainable ecologically or socially according to our definition at the beginning of this article. It destroys the ecosystems upon which all life on Earth depends, and it destroys the small towns and communities that rely on independent small farmers. The big corporate operations buy their seed, feed, and fertilizer by the freight-car load directly from the processor-distributor. They buy their machinery directly from the manufacturer, not from the local implements dealer. Many small towns in the Midwest have closed up.

In sustainable agriculture, diverse crops are mixed in a rotation and/or companion system where one crop replaces in the soil the mineral or element that another crop depletes. Livestock is raised along with crops in order to provide natural fertilizer and to graze legumes that add nitrogen to the soil, where a high-nitrogen user such as corn or potatoes was planted in the last year, or will be planted in the next year. The quantity of livestock raised is just enough to adequately fertilize existing fields, and not so much as to overgraze pastures. In a 1977 study published in the journal *Science*, Warren Johnson and others found that the Amish were the most efficient farmers. The energy output of their products exceeded energy input, and Michael Perelman found that the cost to produce a unit of energy is much higher for industrial farms than for Amish or smaller family farms, because of the high amount of fuel needed to operate the former.

An Amish farm, although often not organic, doesn't deplete soil fertility or pollute surface and ground waters. Sustainable agricultural methods maintain high water and soil quality and help to sustain and support nearby communities. Walter Goldschmidt, in a 1940's study of communities in California's Central Valley, found that smaller farms practice good land stewardship and support local schools, churches, governing bodies, civic organizations, and businesses. Large industrial operations support none of those.

As consumers in an industrial society, most of us are far removed from the reality of food production. Fewer than two percent of Americans are farmers. Eighty percent of the population lives in cities and suburbs. Many don't think about how food is raised or grown, where it comes from, or what toxins may have been applied to it. We are unaware that farm laborers have higher incidence of cancers, respiratory diseases, and children with birth defects than the population at large. Most of us are satisfied to go the supermarket and buy a sufficient amount of affordable food.

What can you do to support sustainable agricultural practices?

(1) You can buy from local farmers who use sustainable methods. Near most cities and towns there are Community Supported Agriculture (CSA) farms. Local people buy their food from the CSA in advance. They help plan what is planted and how it will be managed. They share in the work as volunteers, and when crops are ripe they help harvest and get their fair share of the produce.

(2) Shop at local farmers' markets. Not all vendors use sustainable methods, but many do. Ask them if they use insecticides and herbicides. Some use a lot, some use as little as necessary to rid their fields of damaging insects, and some use none at all.

(3) Urge local grocers to buy from local farmers. By eliminating the broker who maintains warehouses and ships produce cross-country and from other nations, you can pay the farmer a profitable price and probably pay little more, or no more, than you would pay at the supermarket.

(4) You can grow some of your own food and probably have some to share with neighbors or contribute to the local food bank. ♦

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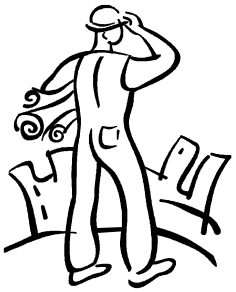
WHAT IS SUSTAINABLE DESIGN?

What is Sustainability?



Many have heard of "Sustainable Design" in the press or other media. These public sources commonly stress energy efficiency, but sustainable design goes far beyond that:

> The most frequently cited definition of sustainability came from the report of the World Commission on Environment and Development (WCED), chaired by Gro Harlen Bruntland, then prime minister of Norway. Sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." [1]

The act of architectural design, like landscape, engineering or industrial design, is the conceptualization of a spatial, physical creation that is not yet in existence. Sustainable design is that same conceptual, creative process that puts the basic sustainability principle cited above into the built environment.

An excellent summary of sustainable design, and the essential difference between it and conventional design, was given by Alex Wilson, President of Building Green, Inc. of Vermont. In testimony delivered to the Senate Environment and Public Works Committee in October 2002, he said this:

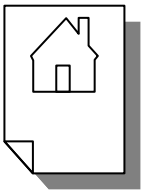
> The Sustainable Buildings Industry Council (SBIC) describes a high-performance school as having three key characteristics:
>
> 1. It is healthy and productive for students and teachers, in that it provides:
> - High levels of acoustic, thermal, and visual comfort;
> - Significant amounts of natural daylighting;
> - Superior indoor air quality; and
> - A safe and secure environment.
> 2. It is cost-effective to operate and maintain, because its design employs:
> - Energy analysis tools that optimize energy performance;
> - A life-cycle cost approach that reduces the total costs of ownership; and
> - A commissioning process to ensure that the facility will operate in a manner consistent with design intent.
> 3. It is sustainable, because it integrates:
> - Energy conservation and renewable energy strategies;
> - High-performance mechanical and lighting systems;
> - Environmentally responsive site planning;
> - Environmentally preferable materials and products; and
> - Water-efficient design.
>
> Organizations seeking to advance high-performance schools all emphasize an integrated, whole-building approach to the design process. This means that the different elements—building envelope, lighting, mechanical systems, etc.—must be considered holistically, from the beginning of the design process through construction and operation of the building.
>
> This is quite different from the design process used in creating most non-residential buildings. The conventional design process is like a relay race, in which the architect designs the basic building and passes the baton to the mechanical engineer. The mechanical engineer designs the mechanical systems needed to maintain comfort, then passes the baton on to the lighting designer, and so on. With integrated design, all members of the design team meet periodically throughout the planning and design process. Synergies are identified—for example, recognition that if better glazings and energy-efficient lighting systems are installed, the air conditioning system (chiller) can be downsized. Identifying these opportunities becomes possible only through a collaborative, or integrated design process.[2]

Clearly, this description applies to most, if not all, building types, although it was specifically intended to address schools. There are many categories and elements mentioned above — the most commonly considered one is energy.

Sustainable Design Is Not Simply Reducing Energy Use

Energy is used by every living and non-living thing known to science. Much of what is considered "sustainable design" is focused on energy: where it comes from and how it's used, how sustainable is its production, and how efficiently it's consumed or converted to useful forms and materials. Remember that the absence of energy is what we know as a temperature of "absolute zero." Sustainable design is not "about" energy any more than it is "about" toxic chemicals or recycling or preserving open land. Sustainable design is about waste, harmony, integration, interaction, time, and cycles.

To achieve improvement, we often take a close look at energy use, so let's do that now. Below is a list of categories, as standardized by an industry group — the US Green Building Council — through which architects address the goals of sustainable design. Within each, I have listed the LEED™ (Leadership in Energy and Environmental Design) point topics. These are not limited to the reduction of energy use, i.e., man-made energy that is centrally produced and inefficiently converted from irreplaceable fossil fuels. But I suggest you read through this list with energy in mind, to see how many interrelationships you can find. Sustainable design is about new processes and better choices. Sustainable design is a state of mind. ♦



[1] From *Stumbling Toward Sustainability*, John C. Dernbach ed., Ch. 27 "Higher Education" by Wynn Calder and Richard M. Clugston, Environmental Law Institute, 2002.

[2] From http://epw.senate.gov/107th/Wilson_100102.htm.

US Green Building Council LEED Certification Categories

Sustainable Sites

Erosion & Sedimentation Control
Site Selection
Development Density
Brownfield Redevelopment
Alternative Transportation
Reduced Site Disturbance
Stormwater Management
Reduce Heat Islands
Light Pollution Reduction

Water Efficiency

Water Efficient Landscaping
Innovative Wastewater Technologies
Water Use Reduction

Energy & Atmosphere

Fundamental Building Systems Commissioning
Minimum Energy Performance
CFC Reduction in HVAC&R Equipment
Optimize Energy Performance
Renewable Energy
Additional Commissioning
Ozone Depletion
Measurement & Verification
Green Power

Materials & Resources

Storage & Collection of Recyclables
Building Reuse
Construction Waste Management
Resource Reuse
Recycled Content
Local/Regional Materials
Rapidly Renewable Materials
Certified Wood

Indoor Environmental Quality

Minimum IAQ Performance
Environmental Tobacco Smoke (ETS) Control
Carbon Dioxide (CO2) Monitoring
Increase Ventilation Effectiveness
Construction IAQ Management Plan
⇒During Construction
⇒Before Occupancy
Low-Emitting Materials
Indoor Chemical & Pollutant Source Control
Controllability of Systems
Thermal Comfort, Permanent Monitoring System
Daylight & Views

Innovation & Design Process

Innovative thinking, plus including a LEED™ accredited professional on design team.

FRIENDS' WITNESS AND THE SEARCH FOR A SUSTAINABLE COMMERCE

by Erbin Crowell

Sustainability, in most basic terms, is the recognition by humankind of the material limits of Creation, and the adjustment of our claims on resources, both present and future, to a level that can be sustained over time. Sustainable commerce, then, would consist of economic structures based in the same values: a model of trade that acknowledges the limitations of the physical world and conducts itself in a manner that supports the viability of Creation in the long term. Such a model requires the recognition that we are not the center of the universe, but are members of a broader web of life that exists around us.

What should be clear is that prevailing economic structures — the ways in which we conduct "business" — are overwhelmingly unsustainable. Far from considering coming generations, our notions of "progress" are extremely narrow and short-sighted. Economic success is described in terms of growth in economic activity, whether this activity is productive or destructive. The structures that govern trade have become increasingly obscured and undemocratic. Rather than spreading wealth, they concentrate it on both a local and global scale, while depleting the natural resources upon which all wealth depends. We can see the results of this path in social conflict, environmental degradation, and mass extinctions of non-human species.

What would a model for sustainable commerce look like? In general terms, it would measure success not simply in terms of growth or profit, but in a broad range of goals and indicators that contribute to overall sustainability. It would (1) distribute wealth rather than concentrate it; (2) serve the interest of community at large, rather than a privileged group; (3) be participatory, not exclusionary; (4) represent the true costs of a product or service — social and environmental — rather than obscuring costs; and (5) be regenerative instead of exploitative. This model would necessarily abandon the concept of *growth* as progress and the mechanism for satisfying human needs, and would shift its focus to being profoundly distributive and participatory in its structures, conduct, and benefits.

But most importantly, a sustainable commerce will be real and imperfect, rather than theoretical and treated as infallible. It will come about gradually, through a combination of government-based incentives, community activism, consumer pressure, and entrepreneurial creativity. The biggest challenge may be that of creating business structures that function in the real world, that push the boundaries of conventional trade by offering models of change, and that lead us toward a right sharing of resources and power — not just in theory — but in our lives today.

Friends have much to offer. From its first days, our Society has claimed that living faithfully cannot be confined within the walls of the church or meetinghouse, or to the limitations of ceremony, but rather must encompass our

everyday lives. To the extent that our *economic* relationships constitute what may be our primary and most tangible interaction with one another and with the world around us, Friends have long wrestled with how to bring our commercial activities in line with our spiritual witness.

For many considering this challenge, John Woolman has been a vital source for reflection and inspiration. Woolman recognized the links between trade and human suffering, and appealed to Friends to consider their consumer habits as integral to their witness to the world. "May we look upon our treasures," he wrote, "and try whether the seeds of war have nourishment in these our possessions." In his writings, he wrestled with the basic requirements of profit and economic growth and the manner in which they led not just to the exploitation of labor, but to broader social conflict, destruction of the environment, and the abuse of animals. As a successful businessman, he took his place in the particular tradition of Friends who, confronted with the opportunity to expand their enterprise, chose instead to place limits on it.

When we purchase an item or service, we become entangled in a web of events and interactions that should be subject to our spiritual leadings.

Woolman presented Friends with a radical notion: The things we buy and sell every day are much more than their material substance — what they taste like, their color or texture, their weight or price — or the service provided. Rather, they are intertwined with the economic, social, and environmental relationships necessary for their production. To extend this idea, when we purchase an item or service, cash our paycheck, invest in a company, or receive a dividend, we become entangled in a web of events and interactions that should be subject to our spiritual leadings.

This vision directly opposed the prevailing commercial interests of Woolman's day, and largely continues to do so in our own. Economic globalization, while it is not an entirely new phenomenon, in our time is greatly accelerated and more comprehensive in its impact on the world. What's worse, our attempts to understand the economic systems underlying our purchases are often more obscured than clarified by the marketplace. As consumers, we're told that price and selection are most important. So, to a large degree we're willing to ignore who actually "paid" more, that is, who or what absorbed the extra cost so that we could find a bargain at the store. Was it the farmer picking the coffee, the worker sewing the shoe, the children breathing the fumes, or the river sweeping away the waste? On the other hand, we seem more willing to pay large premiums for the *image* ascribed to a product than for the *reality* underlying its production.

One response to the recognition of our role in unsustainable economic systems is to attempt to disengage from their activities. We avoid products and services that run counter to our understanding of a just and sustainable economics. Today this idea has parallels in divestment and boycott campaigns, and investment in "screened funds" that do not invest in particularly pernicious enterprises such as the production of weapons and tobacco. Such approaches can dramatically influence the values and conduct of economic institutions.

But disengagement can only take us so far in realizing a more sustainable model of commerce. We may reduce our own role in unjust systems, but leave the same systems, and their

consequences, in place. And there is a danger of the critique of prevailing economic systems evolving into a critique of business in general. A focus merely on disengagement denies our own role in economic structures and the ways in which we benefit from them, while also reducing the potential impact that Friends can have in changing them.

Again, John Woolman's testimony offers powerful guidance in our search for spirit-led engagement in economic affairs. Woolman's vision of our economic lives is not simply negative, but potentially positive — an opportunity to fulfill God's vision for a more just world. To the extent that we are influenced by God's love, Woolman believed, Friends should be moved to "take hold of every opportunity to lessen the distress of the afflicted and increase the happiness of creation," turning our possessions "into the channel of universal love." In this idea, we can discern a call not simply to turn away from the world of commerce, but to engage with it faithfully, and always steer it in directions that would increase its inherent fairness.

We have much in our tradition and history to build on, as we search for a more sustainable model of commerce in our present world. Our testimonies to a *faith* that is active in the world, to *integrity* and the search for Truth, to *simplicity* and how much is "enough," to *equality* and democracy, to *peace* and seeking out the roots of violence, have much to say to the business world. Indeed, Friends have acted throughout history not just in the theoretical analysis of economic structures, but in the creation of alternative models that more closely reflect our faith and perception of God's will: from our early commitment to business integrity and truth-in-pricing, to models of socially responsible investment; from the inclusion of worker welfare in industrial development, to more radical models such as worker-owned cooperatives; from conscious consumption, to modern consumer cooperatives; and from organic farming, to community-supported agriculture and the Fair Trade movement. As Friends, we may ask ourselves what our model of faith, which may be described as radically participatory—both individualistic and communal—can contribute to the search for an economics based in justice, liberation, and sustainability.

As we seek to bear witness, there may be no more important place to bring our efforts to bear than in altering the commercial systems through which we most profoundly effect the world around us. Whether through policy, activism, or creating new models of commerce, Friends must not shy away from this challenge. To the extent we are moved by the Spirit, we will be led to bring our economic relationships into a more just and sustainable balance. ♦

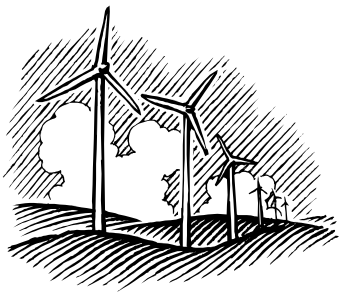
How can we as Friends — as individuals and communities of faith — engage more deeply in the search for a more sustainable model of commerce?

- **First, we can together discern God's will for economic justice and sustainability in the world.**
- **Second, we can learn from our history and encourage new leadings for what more sustainable models of trade could look like.**
- **Third, we can seek out the most promising and effective places to create such models, or support them where they already exist.**

RENEWABLE ELECTRICITY IS SOMETHING EVERYONE CAN BUY

by Ed Dreby

Have you read about "wind farms?" Have you wondered if you might be able to buy electricity that comes from ecologically sustainable sources? Anyone in any state can now buy renewable electricity! This seems to be a closely guarded secret. Everyone who is concerned about climate change, air pollution, dependence on fossil fuel, and the other damage caused by the electric industry should be let in on the secret.



In some states that have introduced retail electricity competition, renewable power can be purchased from an independent supply company or a utility. If you don't live in one of these states, you needn't wait for new state legislation. For a small monthly fee, you can buy a *Tradable Renewable Certificate* (TRC), which some companies call a "green tag" or "wind certificate," for a specified amount of renewable electricity. Are you living in an apartment building or retirement community that buys electricity for you? You can still buy a certificate for as much renewable electricity as you want.

What is Renewable Electricity?

Electricity generated from sunlight, wind, water (hydroelectric), earth's heat (geothermal), or organic matter (biomass) is renewable because it comes from sources that are continually renewed by energy from the sun. Most electricity produced from renewable sources is much less polluting than that derived from fossil-fuel or nuclear facilities. Specifically, renewable electricity generation is either carbon-free, or in the case of burning biomass, carbon-neutral, because it gives back to the atmosphere carbon that was recently withdrawn through photosynthesis.

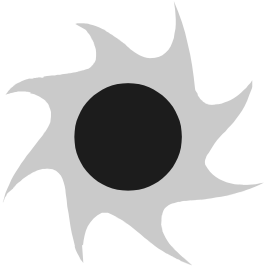
Why is it Important to Buy Renewable Electricity?

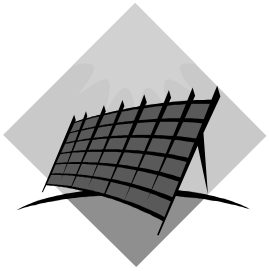
Many people are aware of the contribution that "gas-guzzling SUVs" make to global warming. They may not realize that the greenhouse emissions from the electric power sector are roughly comparable to those of the transportation sector. Hope for reducing emissions from transportation rests heavily on developing hydrogen fuel-cell technology. When this is accomplished, a great deal of energy will be needed to provide hydrogen fuel. If this energy doesn't come from renewable sources, we'll be no better off. Indeed, we'll be worse off, because of the additional energy required to manufacture the hydrogen.

Shifting to renewable technologies will require substantial investments in new generating facilities. Investors need to know there is a consumer market for renewable electricity. Politicians need to know there is a constituency for it. Renewable electricity won't become fully integrated into the electric industry until public policy requires it. In the meantime, every little bit helps! For less than the cost of a pizza a month, you'll know that at least some of the electricity supplied to the grid comes from renewable sources. Every purchase of renewable electricity adds an incentive for companies to invest, and more evidence of support for new energy policies.

What are Tradable Renewable Certificates?

Tradable Renewable Certificates (TRCs) are sold by power marketers — companies whose business is to arrange for the sale of power from generating facilities to electric-supply companies and utilities. A TRC is a contract with a marketer for them to sell a specified amount of electricity from renewable sources into the power grid each month through the wholesale market. Your monthly fee for the TRC represents your payment for the difference in cost between renewable and conventional generation. You continue to pay your own electricity supplier for what you use, priced at the current retail rate for fossil-fuel and nuclear-generated electricity. The amount of renewable electricity that your TRC buys goes into the grid, regardless of how much you actually use.



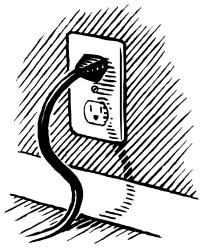


In states offering retail choice, if you buy renewable electricity as a product, your electric supply company pays for delivery of electricity into the grid based on the amount you use, and you pay the supply company the retail price of renewable electricity. Your supply company buys renewable electricity from a power marketer and receives both a contract for the delivery of power and a TRC for the amount of the purchase.

This certificate system emerged a few years ago in states that restructured their industry to provide retail competition. Because electric supply companies don't know the costs they have incurred until their customers' meters are read, the wholesale market in TRCs — separate from the wholesale market for the electrons that create grid power — became an essential aspect of retail restructuring.

A supply company selling renewable electricity is required to possess enough TRCs to meet their obligations to their customers. Supply companies contract with power marketers in advance for future deliveries to the grid. If they contract for less electricity than their customers actually use, they must also make additional purchases after the fact to cover their customers' use. If they contract for more than their customers use, they have electricity to sell. The same situation exists with the buying and selling of TRCs. Because power grids are regional and all interconnected, the wholesale TRC market paved the way for power marketers to sell TRCs directly to retail customers in any state, with or without restructuring.

Power marketers selling TRCs to retail customers sell the electricity to supply companies at the wholesale price for conventionally generated electricity. They cannot provide the supply company with a TRC because the TRC has already been sold to a retail customer. For this reason, a consumer buying a TRC has the same effect as buying renewable electricity as a product — electricity is added to the grid from a renewable source. The only difference is that with a TRC, the quantity is determined by the contractual amount of the TRC, and with a product, the quantity (and cost) is determined by the amount actually used as measured by the meter.



If We Buy Renewable Electricity, How Do We Know We are Getting What We Pay For?

There are several organizations that certify renewable electricity. The most prominent is the Center for Resource Solutions, which sponsors Green-e certification. Green-e is a label certifying

that a renewable product or TRC meets specific technical and ethical standards established by the non-profit Center for Resource Solutions. It certifies products, not companies, because many suppliers that sell certified products also sell non-certified products. Green-e publicizes its standards, as well as the availability of certificates and products in each state, on their website, www.green-e.org, and conducts annual audits to ensure that the standards are met.

Green-e does not certify electricity from trash-to-steam plants, which some states classify as renewable. Other renewable sources that have been controversial among some environmentalists are biomass projects involving factory-farm wastes and landfill methane. Green-e evaluates biomass facilities on a case-by-case basis. After extensive consultation with independent scientists, it was concluded that using landfill gas to generate electricity in compliance with the standards of the Clean Air Act is far preferable to flaring it or permitting its release.

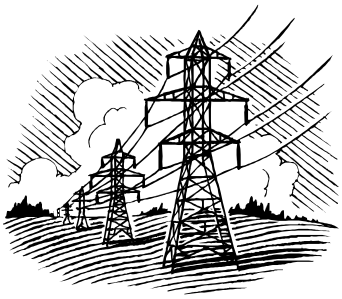
It is important to understand that electricity comes through your meter from the pool of electrons in the region's electric grid, and all electrons are the same. When you buy renewable electricity, whether as a product or certificate, you are paying for electricity put into the grid on your behalf from a renewable source. It means agreeing to pay more than your neighbor pays for the same end product.

There is no technology without ecological impact. The range of impacts among suppliers of conventional electricity is huge, and there is also a range of impacts among the renewable products. The Power Scorecard website sponsored by Pace University, www.powerscorecard.org uses an index to evaluate the environmental impacts of the products of many retail electric-supply companies and marketers of certificates. If you have a choice of suppliers, you may want to check the Power Scorecard website. However, no choice we make about how electricity is generated changes the obligation to use as little as is reasonably possible.

Renewable Electricity and Public Policy

In the context of current economic conditions in the United States, creating an energy-efficient electric industry based on renewable generation will require major changes in public policy at the national level. The industry is national in scope, and dominated by large corporations with many vested interests that cause them to resist change.

Some foresighted, economically secure corporations are buying renewable electricity. They are learning that they can cover the added cost and still add to their bottom line by investing in energy efficiency. But any company that depends on success in a competitive market is apt to lose market share to competitors and/or earn less profit for investors if its energy costs are higher. Recent and proposed changes in energy policy, including electric restructuring, are focused on using competition and government subsidies to lower prices, rather than on using regulations, taxes, or subsidies to reduce ecological costs by raising prices.



What is Electric Restructuring?

Electric restructuring means separating ("unbundling") the functions of generation,

transmission, and distribution. It introduces price competition in the generation function while preserving the distribution as a regulated monopoly. Wholesale price competition within the electric industry has existed since 1992 as a result of changes in Federal regulatory legislation. The other form of restructuring, which its proponents call "deregulation," refers to creating retail price competition or "electric choice" for retail customers through the regulatory role of state governments. The proponents of electric choice were influential in many states until California, the first state to introduce it, had a temporary supply problem and price spike in the winter of 2001. This seems to have slowed the momentum toward introducing retail price competition in many states.

It is essential to institute a tax on carbon emissions.

What Are the Pros and Cons of Electric Restructuring?

The main impetus for "electric choice" comes from industrial and large commercial customers who want to negotiate volume discounts with suppliers. Its proponents contend it will result in greater efficiency and lower prices. Consumer and environmental organizations are divided on the issue of retail price competition. Some see it as an important means of lowering prices for consumers, improving efficiency, and promoting renewable technologies through consumer demand. Others see it as creating additional ways to weaken the ability of governments to protect society and the environment from the excesses of unregulated markets, and for large companies and shrewd operatives to increase their power and profits at the expense of the general public. Consumer and environmental groups are united in their opposition to the energy legislation Congress is currently considering, because it contains so little that addresses societal and environmental costs.

Several organizations, among which are the Union of Concerned Scientists and the National Religious Partnership for the Environment, take no position on the issue of restructuring to provide retail competition, believing that how the industry operates in other ways is more important. Improving efficiency is essential, but keeping energy prices low doesn't help reduce energy use. Making a timely transition to a more decentralized energy system based on renewable technologies can be promoted or thwarted with or without "electric choice." The opportunity that now exists for anyone to buy renewable electricity in the form of a certificate removes a major reason to promote retail competition for potential environmental benefits.

What Policies Will Promote Transition to Decentralized, Renewable Technologies?

There are two key elements for promoting decentralized renewable energy that need to be included in Federal and/or state legislation relating to the electric industry:

1. A progressive "renewables portfolio standard," requiring all electric utility and supply companies to gradually increase the percentage of renewable electricity in their products.
2. A "net metering requirement," stipulating that small independent generators — homeowners and small businesses with solar panels or micro-turbines — only pay for the difference between what they take from the grid and what they deliver to it.

It is also essential to reduce and eventually eliminate subsidies, incentives, and preferential tax treatment for fossil and nuclear industries, and to strengthen subsidies and incentives for renewable technologies.

Perhaps the single most important short-term policy goal is to prevent the weakening of existing

air-quality regulations and to end the exemption of older coal plants from current air-quality standards. It is essential, as soon as public sentiment will support it, to institute a tax on carbon emissions.

Why Does Renewable Electricity Cost More?

The fact that renewable electricity costs more points to a fundamental disconnection in the way we think about money and what we buy with it. We know, on the one hand, that much of what we buy entails costs to society and damages to the earth that are not part of the price. We understand that prices must reflect full costs, if the economics of markets are to benefit society as a whole and make a sustainable human-earth relationship possible. Yet we persist in thinking that if something costs more, we shouldn't buy it because someone is ripping us off.

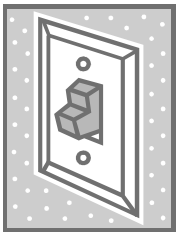
Many people ask "How long will it be before the cost of renewable electricity comes down?" The renewable energy now being sold, which is mostly from landfill gas, wind turbines, and hydropower, would be cheaper than energy from coal, oil, or nuclear fuel if all government subsidies were eliminated. The questions we need to be asking are, "How long will it be before public policy changes so that energy prices reflect real costs and go up—way up?" and, "What can we do as citizens to bring this about?"

One thing we can each do is to pay more for our own electricity, so that the amount that we use comes from renewable sources. We can reduce the effects of the electricity we use on the earth and future generations. ♦

For more information about how you can

SWITCH

to renewable energy see:



Green Power Network

www.eere.energ.gov/greenpower

EPA Green Power Partnership

www.epa.gov/greenpower

Green-e Renewable Electricity Certification Program

www.green-e.org

SOCIALLY RESPONSIBLE INVESTING

by Alan, Wright, Ph.D.

The Corporate Library defines socially responsible investing (SRI) as an investment strategy that seeks to achieve social as well as a financial return, usually by investing in companies that function ethically. Sometimes referred to as the "double bottom line," this approach to investing takes into account factors other than mere profitability. SRI investors usually seek to align their personal values and financial goals by investing in companies and organizations that display values comparable to their own.

While SRI language is new, the notion of principles guiding decision making and action is as old as religion itself. The Great Law of the Haudenosaunee, the Six Nations Iroquois Confederacy, required that Iroquois chiefs consider the impact of any decision on their people seven generations to come. This pre-European example of socially responsible thinking, while not about investing per se, would have governed investment decisions, had the Iroquois been investors.

Quakers embodied an early example of socially responsible investing. In 1660, George Fox told Charles II that "the spirit of Christ, which leads us into all Truth, will never move us to fight any war against any man with outward weapons, neither for the kingdom of Christ, nor for the kingdoms of this world." Based on the Quaker peace testimony, 17th Century Friends refused to invest in, or be associated with, businesses selling weapons.

In the 1920's, SRI was the province of "avoidance investors," individuals who shunned the stocks of certain businesses. This usually meant "sin stocks" connected with alcohol, tobacco, or gambling. Religious groups like the Friends also avoided investing in companies involved in weapons production or other war-related industries.

SRI broadened its scope in the 1970s, as shareholders at annual meetings presented resolutions to change corporate policy for ethical rather than financial reasons. The first South Africa resolution was introduced in 1971. Then, in 1972, a professor at Yale University and a staff member at the Ford Foundation simultaneously developed the concept of PRIs (program-related investments), which sought social as well as financial returns.

PAX World Fund, the first socially responsible mutual fund, began in 1971 with only $101,000 in assets. Jack Corbett and Luther Tyson, the fund's founders, had two objectives in establishing their SRI fund. First, they hoped to make it possible for people to make investments consistent with their values. Secondly, they hoped to challenge corporations to establish and live up to specific standards of social and environmental responsibility.

By 1993, there were only twelve socially screened mutual funds. Over the next six years, that number had grown to more than 175. Between

1997 and 1999, socially responsible assets grew 82%, almost twice the rate of all assets under management in the U.S. By 1999, Nelson's Directory of Investment Managers reported that nearly one in every eight dollars under professional management in the U.S. was subject to social screening.

Today over $2 trillion dollars fall into the "socially responsible" category – a remarkable growth when compared to the $100,000 initially set aside by PAX World Fund. The SRI industry has identified three distinct activities, the three legs of the socially responsible investing stool. The first, and most commonly associated with socially responsible investing, involves social screening. Individual investors, brokers, or mutual fund managers evaluate investment opportunities based upon social criteria that go beyond profitability. The earliest screens of alcohol, arms, tobacco, and gambling have grown to include treatment of workers, environmental records, the use of animals in product testing, and connection to the nuclear-power industry, to name only a few.

The second leg of the SRI stool, sometimes known as "the muscle of SRI," is shareholder activism. Shareholders, the owners of all publicly held corporations, have the right to vote on, and to introduce resolutions that effect the company's behavior. Thanks to shareholder activism, Home Depot agreed to sell only sustainably harvested lumber; General Electric dedicated millions of dollars to clean PCB's from the Housatonic River; while Ford, Chrysler, GM, and Texaco resigned from the Global Climate Coalition — a business association trying to prevent government action on climate change.

The Interfaith Center on Corporate Responsibility (ICCR) has been at the forefront of filing resolutions since the 1970s, when it took action to pull companies out of South Africa during the apartheid era.[1] Another non-profit active in share holder activism is the As You Sow Foundation.[2] The Shareholder Action Network,[3] a project of the Social Investment Forum attempts to keep track of all shareholder actions in the U.S. At present, only 20% of all SRI's participate in shareholder actions.

"Community Investing" is the third leg of the SRI stool. Community investments usually benefit low-income communities in need of improved housing or provide micro-credit for small businesses or small-scale sustainable agriculture. Community investments can be made through community development banks, loan funds, and credit unions. Investments in these institutions include loans, checking accounts, savings accounts, CDs, and money market accounts. The Community Investing Center[4] lists hundreds of direct community investment opportunities, both domestic and international.

Paul Hawken, author of *Natural Capitalism*, says that more uniform standards are needed to guide socially responsible mutual funds in determining what companies to include and which to exclude. He has called for public disclosure, or transparency, of the criteria, or "screens" companies use. He has also pointed out that the screens, particularly the "green screens," focus almost entirely on reducing "bads" rather than promoting "goods."

Only a few funds concentrate on investing in companies that specialize in less damaging products and/or technologies. Investment advisors tend to characterize these funds as risky. Reducing risk requires diversifying one's investments in well-established companies. One might ask if it is realistic in today's economy to expect that an investment can: a) yield a good return, b) at little risk, c) while applying standards that increase the

costs of production, d) without contributing to an increase in the overall level of consumption.

To best sort out how one can use savings to earn a return, while at the same time reducing one's eco-footprint or promoting social justice, we might think in terms of an analogy to slavery.

Everyone today will agree that the institution of slavery was a manifest evil, even though, 150 years ago, a consensus was not so easily achieved. People who owned slaves in the U.S. found ways to justify to themselves their decision to keep slaves. Whatever their reasons, they all profited from the keeping of slaves.

Today's investors, wishing to make socially responsible investments, may wish to begin their research by asking, Were I to own shares in companies engaged in polluting the environment, selling weapons, running sweat shop manufacturing, would I be profiting from such ownership, much as the slave owner profited from the exploitation of his slaves? A first step away from such profits would be to review one's investments and stock portfolio (as well as consumer choices) to make sure that one's values are not compromised by one's investments.

In addition to not owning slaves, there were those active in the abolitionist movement, who dedicated some or all of their lives to ending the institution of slavery. One might draw an analogy between abolitionists and shareholder activists. Shareholder resolutions attempt to redirect companies and even entire industries away from practices that harm the environment or contribute to war or social injustice much as the abolitionists attempted to end the practice of slavery. While individuals can vote their proxy ballots, it is more difficult for isolated shareholders to introduce successful corporate resolutions. Should an investor be motivated to make positive change through shareholder action, he or she would be well advised to join a group or invest in a mutual fund currently engaged in such actions.

Extending the slavery metaphor further, we might argue that people participating in the underground railroad to assist fugitive slaves and in aiding those newly freed slaves are comparable to investors today choosing to make direct community investments. Community investing may not alter corporate behavior, any more than the underground railroad could have brought an end to slavery. It does, however, make badly needed resources directly available to communities in need, just as those working the underground railroad took risks to benefit particular individuals and their families.

The SRI industry, while young, is vibrant and growing. Investors today have many more socially responsible options than did their investor counterparts fifty years ago. What to choose will depend on each individual's values, passions and interests. The SRI industry will continue to evolve in response to these choices. ♦

[1] Contact ICCR by calling: (212)870-2296 or by visiting their website at: **www.iccr.org**.

[2] As You Sow can be reached at: (415)391-3212 or on the web at: **www.asyousow.org**.

[3] (202) 872-5313, www.shareholderaction.org.

[4] **www.communityinvest.org**.

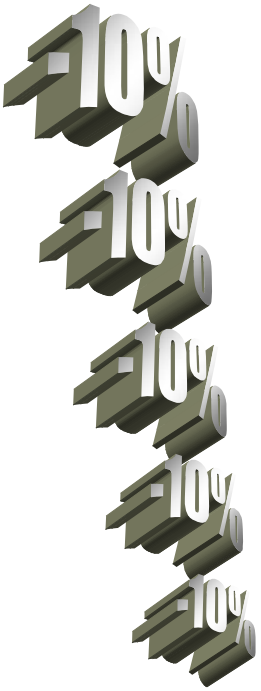
MEETING GOD HALFWAY
One Way to Engage in a Quaker Witness on Economic Justice and Ecological Concern

by Gray Cox, Acadia Friends Meeting

A version of this article has appeared in Friends Journal

I want to invite you to consider a relatively simple and straightforward action that could, nonetheless, perhaps, be especially rich and fruitful in its consequences.

God calls out to us in the voice of every suffering person on this globe who is in need of a good Samaritan. And God asks us not simply to give once, to help an individual, but to follow the advice Jesus gave the lawyer who wanted to be saved: "Sell all that you possess and give it to the poor." But we, like the lawyer, turn away from this text in sadness, because we have so much, and we find it hard to see how to change. It is difficult to see how to arise today, go out and meet God on Jesus' terms. Yet perhaps given a more reasonable amount of time to work up to it, might we be able to imagine meeting God halfway?



God speaks to us not only in the voices of people but also in the signs of nature that show so plainly that the integrity of this Earth is being pushed beyond its resilience, beyond its ability to absorb and recover. Plain reason based on clearly established fact argues that the consumption of the earth's resources cannot be sustained at the level of the U. S. today if the other citizens of the world catch up with us – let alone if we and some of them continue to plunge ever upwards in consumption levels. One convergent set of estimates suggests that the earth's ability to function as our home can only be sustained if the typical person consumes about one half of what the average American uses up now, already, on an annual basis.

Simple reciprocity seems to demand that whatever level of consumption we set for ourselves should be one that others can aim at and practice. Some kind of relative equality in consumption patterns, in the long run, seems not only fair but relatively inevitable. Why? Others are not likely to agree to anything less. If we try to force them to accept unequal shares they can spoil our game by over consuming themselves and thereby hasten the ecological crises for us all — or by taking up weapons of embargo, terror or war to resist any continuing regime of global apartheid that leaves them out.

We live in a time of empire, just as Jesus did. And we are called to resist the domination of economic and political forces that aim at exploitation and conquest. But our voices each count so little because they are spoken with votes that are not adequately multiplied by the power of wealth. The plutocracy in which we live has clear rules to its game. In them a relatively small part is played by majority rule. Money counts more heavily. And unless and until there is money for the right things — "might for right" — then we will continue to see a world in which the money of today, like the might in the days of King Arthur, "makes right." In Gandhi's day, it was the willing obedience of millions of Indians that enabled a few hundred thousand British to rule their subcontinent. It was the withdrawal of that obedience and its redirection in civil action that led to the liberation of India. In our day, it is the control of millions of dollars of research and campaign monies that enable a small elite to manipulate the votes of millions of Americans. It will only be by the

redirection of our money that we can achieve the national policies that reflect God's love for all people and for all of creation – a world free from war and the threat of war, a society with equity and justice for all, a community where every person's potential may be fulfilled, and an earth restored.

One simple action we might consider taking is to adopt a plan to cut our consumption by 10% this year — and 10% the following year, and 10% more the year after that until, at the end of five years, we will have cut our consumption by 50%. We can take the remainder of our income and spend it either on direct aid to those in need, on political efforts to change the world or on investments in natural and community capital that will restore the earth currently being destroyed.

This action is simple in that sense that the basic step to be taken is relatively clear to understand and justify — though like any clear and reasonable action it requires appropriate application to the specific circumstances of peoples' lives. The action is also simple in the sense that it is a step towards simplicity of living — though like any simplification of life, it can involve a subtlety and complexity of sensitive understanding.

This proposal is not meant to be laid on Friends as a rule to be followed but as a possible guideline to be considered. For example, depending on the stage and condition of life one is in, it may make sense to arrive at 50% by increasing income rather than decreasing consumption. This might be true for two young people marrying and starting a family, for example. Others with incomes much more than twice the median income in the U. S. may perhaps find that they should consider cutting their consumption to substantially less than half of their income. If people at different stages of life all aim at the 50% goal, the average consumption will be reduced appropriately.

Part of the idea of the proposal is to set a goal that is reasonable enough for the average family to make reasonable progress on in a period of time that is still short enough [five years] to start moving us rapidly to the levels of consumption and social change that are required to address the crises we are facing.

It might be wondered whether this is a political proposal or a spiritual call? It is meant to be both.

In practical terms, the core idea in this proposal is to provide a reasonable guideline that can be widely followed and which, if followed, will yield the kind of dramatic change needed to really address the economic and ecological crises we face. But the underlying motive at stake is not to fix the world. It is to fix our souls.

As long as we refuse to see the destructive consequences of our actions, we are living in denial, living in falsehood — living apart from that spirit of Truth that is the Honesty in which alone God can be felt as Present.

As long as we treat ourselves as special and as exceptional, letting ourselves have more than others have or even can have, then we are living in a cocoon of egotism and pride and self that shuts out the concerns and voices and spirits of all those others who are children of God and through whom God is present — and we are shutting ourselves up in cages of "me and mine" and "here and now," closing out the "we and ours" and "in all places and all times" that is the Divine.

As long as we are willing to defend our claims for special privilege by supporting the current system of empire and global apartheid, then we are not living in virtue of that power and life that takes away the occasion of all war.

We would like to suggest that Friends may be called, for the sake of their consciences and for the sake of their yearning to live in the Presence of God, to give serious consideration to this proposal as one way of living out our testimonies for Truth, for Simplicity and Equity and for Peace. ♦

ECOLOGICAL INTEGRITY AND RELIGIOUS FAITH
An Appeal to the Religious Society of Friends

by Keith Helmuth

A version of this article has appeared in Friends Journal

Ecological Integrity: The Foundation of All Friends' Concerns

There is a growing recognition among Friends that ecological integrity is not just one more concern to be added to an already long list of concerns. We are coming to a sense that to continue representing the ecological issue in our corporate forums as a "special interest" is to remain unresponsive to a central spiritual task of our time: re-adapting human habitation and economic behavior to the biotic integrity of earth. The ecological situation is not a "concern" in the usual sense of the word, nor is it a "special interest." It is the foundation of all concerns and the most general and comprehensive interest possible. It is both the given and created reality out of which everything we care about and work for develops. The human-earth relationship is the context in which all concerns are situated. Justice, equity, and peace, as well as spiritual well-being, have no basis other than the human-earth relationship on which to flourish or wither, as the case may be.

All the areas of human concern that Friends have traditionally addressed will be negatively affected by the ongoing, disruptive impact of human activity on biospheric integrity. Ethnic, political, and economic violence will be exacerbated. Human settlements, livelihood, and food production will be increasingly disrupted. Existing social and economic inequities will be magnified. Deficiency, stress, trauma and disability disorders will multiply. Spiritual disorientation will spread. All of these phenomena are already on the increase. Continued deterioration of earth's habitability will drive them into new and more extreme forms. Given the Quaker heritage of closely bonding religious faith with the work of human betterment, it is difficult to see how we can avoid bringing the crisis in the human-earth relationship into the center of our perspective.

Global Warming Epitomizes the Damaged Human-Earth Relationship

In 1990, the World Council of Churches held a ten-day convocation in Seoul, Korea on Justice, Peace, and the Integrity of Creation. This gathering identified the ecological disruption that will attend the advance of global warming as the pre-eminent threat to earth's communities of life. It further agreed that because human economic activity is contributing to global warming, this situation is an issue of fundamental religious import that must be addressed by the world's communities of faith. A decade later, the global warming issue is prominent on the witness and action agendas of many religious congregations and associations.

Although the patterns of humanity's ecological violation are manifold, the specter of ecological disruption that will accompany the advance of

global warming rises like a particularly ominous thunderhead over the landscapes and shorelines of earth. Human induced, disruptive climate change epitomizes what is wrong with the current human-earth relationship. It is an incontrovertible fact that everyday human activity is increasing the global warming problem. For those who have come into a full realization of this situation, the problem verges on the unbearable. It has a mind-numbing and spirit-damaging quality.

Retaining Our Faith as Ecological Disorders Multiply

It is difficult to see how we can claim a clear sense of Divine presence while all around us, the production and use of energy on which we depend, and the patterns of economic activity that support us, are steadily grinding down and disabling the integrity of Creation. It is not just a matter of earth's environment becoming a less hospitable place. It is also a matter of increasingly losing the sense of the Divine as a whole-earth reality, as a cosmic loom interweaving all communities of life. The evidence of this cultural devolution is all around us. We cannot continue breaking up and laying waste the functional relationships that compose the integrity of Creation, and expect to retain a viable sense of the Divine.

As ecological disruptions multiply, the issues of human adaptation will become increasingly skewed toward the struggle for bare survival on the one hand, and the determination to defend wealth and privilege on the other. In fact, this state of affairs is already upon us. As hard-edge

From My Personal Experience: The Melting of Mountain Glaciers

I have been particularly interested in recent reports about the rapid melting of glaciers on the mountains of East Africa, and the effect of this change on the water supply in the regions around them I once spent some time at a cattle ranch on the northwest flank of Mt. Kenya, where the streams of glacial melt-water run full and cold year round. The operation was owned by Gerard and Mary Casey, English Quakers, and originally included over 16,000 acres. The Caseys had turned most of the holding over to a government settlement program and had retained a ranching business on the remainder. It was the reliable, glacier-fed water supply that made the area close to the mountain's base suitable for homestead farms, and the plains that extended to the north suitable for ranching. A large range of wildlife also frequented the area, drawn by the ample supply of water. One of our campsites on the plain was a place called Sirakoi, which means "zebra water." Here, thirty miles downstream of the glaciers, the water ran cold and refreshing in a hot desert land. We awoke each morning to gaze at the jagged volcanic peaks, laced with glaciers and glistening in the equatorial sun.

I am now wondering what will happen to those many homestead farms as the water supply fails, and to the many animals that for countless generations have known exactly where to find the life-giving water. Because I know this one region and can see the families in their shambas (gardens) parceling out the gift-of-the-mountain water to their crops, and because I know there are many regions around the world where this human-earth relationship sustains families and settlements, I can imagine the disorientation, dislocation, and suffering that will occur as glaciers disappear, along with the water they once so reliably supplied. It is now estimated that in fifteen years the East African glaciers will be gone — a rate of melting for which there is no precedent. And for what? So we, the wealthy of the world, can be surrounded by abundant electricity and have unlimited, high-energy transportation at our command?

survival and the protection of privilege become the dominant contending motivations of social existence, it will become ever more difficult to bring ecological consciousness to bear on public policy. As the human-earth relationship unravels, at stake are no less than the abilities to maintain an overarching faith – an encompassing sense of the Divine – and to work with conviction for the common good.

If we seek for our faith a mode of expression and breadth of address in the world that reaches to the center of the human dilemma, that faith must move fully into the ecological worldview. This more fully grounded perspective will provide clear and useful openings at a fundamental level into all peace, justice, and equity issues, and enable us to help reconceive the whole project of human adaptation to the environments of earth.

With the imperative of ecologically sustainable adaptation firmly lodged at the center of our faith, we can then develop our peace, justice, and equity work in ways that contribute as fully as possible to a reweaving of the human-earth relationship. Thus can we keep alive an encompassing and nurturing sense of the Divine. Even if we, and all others who are working in a similar way, do not succeed in moving our society out of its ecologically destructive ways and onto a sustainable path, we will at least know we have done the right thing. That may be small comfort, but it may also be the difference between a sense of having been faithful and the despair that will certainly overtake denial and inaction.

Humanity's Choice

Humankind has now come to the time when the options are perfectly clear: either we continue down the road of unlimited economic expansion and increasing energy use until a convergence of ecological breakdowns stops our cultural momentum, or we place ecologically sustainable adaptation at the leading edge of human habitation and economic behavior.

Recalling the Slaveholding Dilemma for Early Friends

This dilemma, and the choices it presents, bears a striking resemblance to the issue of slaveholding with which the Society of Friends struggled, and on which it eventually came to a clear focus. In both cases the fundamental issues are the same: control and use of energy, economic productivity, convenience, aggrandizement, massive inequities, and the effect on the souls of all those who were (are) enmeshed, in whatever capacity, in a system of unsustainable exploitation.

These similarities are not happenstance. The end of slavery coincided with the full development of the machine-based factory system, expansion of coal use, and the discovery of petroleum. The exploitative mindset and inequitable relationships of the old economy were preserved in the new. This is why John Woolman's observations on economic behavior and social relations continue to be highly pertinent to our time. Because the whole political economy was, and is, driven by the unquestioned assumption of endless growth, no reflection on sustainable adaptation has ever gained a significant public hearing. The expanding-frontier mentality and the vast "natural resources" of the continent made possible what historian William Appleman Williams calls "the great evasion" — a situation that has neglected to fully consider the fundamental values, attitudes, and relationships required to achieve a sustainable pattern of settlement and economic activity within regional ecosystems, and over the continent as a whole. This "great evasion" has continued unabated to the present time.

Calling Friends to Action

As the Society of Friends rose to the issue of slavery and eventually reached clarity on the kind of change that was required, so, it would seem, it might now rise to the issue of ecological degradation in general, and the situation of energy use and disruptive climate change in particular. Although it was certainly not easy for Friends to become collectively clear about slavery, it may be even more difficult to achieve a sense of clarity and undertake effective action with regard to ecological degradation.

When Friends voluntarily gave up slaveholding, the primary economic activity of farming could still be carried on with the human energy

of hired labor, which, as Woolman so eloquently pointed out, must also be seen within a moral context. But with the subsequent shift of the economy to machine-based manufacturing fueled by coal and oil, the cautionary moral dimension around energy use disappeared. In fact, the new technologies gave rise to a new morality of energy use which said, in effect, "the more the better." We now understand that this era of high energy use has been a terrible adaptational mistake. Despite the undeniable advances in convenience that a high-energy economy affords, the damaging impact of this adaptational stance on the biotic integrity of earth has now — as in the days of slavery — brought the moral issue to a very fine point.

When Friends disavowed slavery, it mainly affected only those still exploiting the energy of slaves. Addressing the present issue of energy use, and the way it exploits and damages earth's communities of life, is a considerably more difficult matter. Virtually everyone in our society lives off the pattern of energy production and use that is damaging earth's biotic integrity and leading to increasing ecological disruption. Nothing less than a major re-adaptation of human habitation and economic activity is required to address this situation. Because the magnitude of our dilemma encompasses the whole adaptational stance of our culture, it reaches deeply into our spiritual life. It reaches right into the center of our identity within Creation.

In response to the spiritual dimension of our ecological dilemma, a movement of witness and action is growing in communities of faith worldwide. It seems obvious that the Religious Society of Friends, given its history, should move strongly into collective action on behalf of Creation and a sustainable human-earth relationship. Thus will all of Friends' traditional concerns and areas of work find an expanded context and renewal of orientation.

Summary:
Our Predicament, Our Responsibility

In summary, the following can be said:

1. The biospheric conditions that have brought earth's communities of life to their present state of mutual interdependence are at the core of ecological integrity. The disruption and deconstruction of this ecological integrity is a direct and blasphemous challenge to the goodness of God in Creation, and is counterproductive to human security and sustainable economic activity. It is damaging to our sense of the Divine and to a viable, sustaining faith.
2. The most immediate and comprehensive manifestation of this disruption is global warming, about which the fundamental science is clear.
3. Our society has the technology and the skills to reconstruct human habitation and economic adaptation within ecologically sustainable norms.
4. At present, our society collectively lacks the moral conviction, political will, and financial incentives needed to significantly advance the work of ecologically sustainable adaptation.
5. Communities of faith, by virtue of their claim on a relationship with the Divine, are under an obligation to provide leadership regarding the integrity of Creation and on the work of ecologically sustainable readaptation.

Concluding Queries

Can Friends transcend the "special interest" view of our approach to the ecological predicament?

Can we find a renewed sense of spiritual purpose in the task of reweaving all our concerns into a truly ecological worldview?

Can we provide leadership in addressing public policy on behalf of the integrity of Creation?

Can we engage in the practical tasks of readapting our habitations and lifestyles to the biotic integrity of regional ecosystems?

Can we provide leadership in addressing public policy on behalf of the well-being of earth's whole community of life? ♦

GLOSSARY

Allocation: the process by which an economic system determines what goods and services will be produced.

Anthropocentric: view or perspective that knowingly or unknowingly sees humankind as the most important element of existence.

Arbitrage: the simultaneous buying of financial instruments on one exchange (at a lower price) and selling on another exchange (at a higher price) to make a profit on inefficiencies in a financial market.

Atmosphere: the gases surrounding the earth.

Bank money: money created when banks make loans and issue bank notes (checks) that circulate as money through the economy and the banking system.

Base money: money in the form of *currency* created by governments.

Biocentric: view or perspective that knowingly or unknowingly focuses on the importance of all life and which therefore regards the rights and needs of humans as not more important than those of other living things.

Biological productivity: the ability of life to create more life, the primary form of which is photosynthesis.

Biosphere: the parts of the earth, including soils, water bodies, and the atmosphere, inhabited by life.

Bretton Woods agreements: International agreements made in 1945 which established the *International Monetary Fund (IMF)* to stabilize currency, the *World Bank*, to make loans to developing nations, and a framework for trade negotiations that laid a foundation for the *World Trade Organization (WTO).*

Capital: *traditional* economics definition — surplus used to increase the ability to produce goods and services; *ecological* economics definition — a physical stock that yields a flow of useful energy or material. The ecological definition places human economic productivity in the context of the earth's geological and biological productivity. Economists now distinguish among several different form of capital:

***Financial* capital:** money used to increase the ability to produce.

***Human* capital:** the acquired knowledge and skills of individual people.

***Intellectual* capital:** knowledge and skills embodied in plans and instructions; human technological know-how.

***Natural* capital:** goods and services provided by ecosystems; the stocks in nature that provide flows of useful energy and matter.

***Manufactured* capital:** goods used to produce other goods and services, like factories, tools, power plants and roads; the tools of all kinds that are used to produce goods and services, both for consumption and for producing more capital. Also called *physical* capital or *real* capital.

***Social* capital:** contributions to economic productivity by institutions of family, community, and governance; the values and expectations that enable individuals to work with one another and within organizations.

Traditional economic analysis tends to view other forms of capital as independent of natural capital.

Ecologically oriented economic analysis holds that other forms of capital depend on natural capital.

Capital investment: spending to maintain or increase the capital stock.

Circular flow diagram: *Simple* — a simplified model of economic activity in markets for goods and services that relates employment and income to consumer demand and business production; *Enhanced* — a simplified macro-economic model of economic activity that includes the role of government and finance in the economy.

Closed system (s*ee* System)

Consumption: consumer spending; household spending on ordinary goods and services, usually limited for technical purposes to those that are used and disposed of in the same year they are produced.

Cost-benefit analysis: a micro-economic tool which involves weighing current and projected future costs against current and projected future benefits to assess the potential results of a particular course of action.

Debt: (*see also* Spiraling debt) an obligation, in economics usually a financial debt.

Depression: severe decline in economic activity, where both consumer and business spending are reduced, thus lowering demand and employment. During the world-wide Great Depression of the 1930's, many nations experienced unemployment rates of 20-30%.

Distribution, of goods and services: answers the third of the three traditional economic questions — What is produced? How is it produced? Who gets it?

Distribution, of income and wealth: how income and assets are distributed within a population.

Division of labor: specialization of labor which divides the tasks of production into smaller parts and increases *productivity*.

Ecology: the study of relationships among living things with one another and with the earth.

Ecological economics: the study of economics in an ecological context. Ecological economists see the economy as a dependent subsystem of the earth's ecosystem rather than as an independent system.

Ecological footprint: a rough estimate of the amount of biologically productive land per person that would be needed in order for *renewable* resources to provide all goods and services (food and water, shelter, possessions, energy, and other physical requirements, including the recycling of wastes) needed to sustain a particular lifestyle. Two extreme examples: Mozambique has a footprint of .5 acres while the U.S. footprint is 24 acres. Much of the U.S. footprint comes from energy use.

Ecological (or environmental) Impact: ***I = P x A x T*** is a simple expression, attributed to biologist Paul Ehrlich, of the understanding that the human ***I****mpact* on the environment is a function of the

total human ***P**opulation*, the average per capita use of energy and resources (or ***A**ffluence*), and how ecologically benign or destructive the effects of the ***T**echnology* with which resources are used.

Ecological Integrity: relationships among the populations of an ecosystem's species that sustain the system as a whole and enable it to adapt to environmental change.

Ecological Niche: a sustainable population of a species in an ecosystem.

The growth rate of any population is the birth rate minus the death rate. A population establishes an ecological niche when its growth rate averages zero. This applies to populations of human artifacts as well as to human beings.

Economy, real and financial: the *real economy* produces tangible goods and services; the *financial economy* produces various forms of legal claims on real wealth.

Economics: the study of the ways societies organize themselves to produce and distribute goods and services.

Economics and **ecology** come from the same Greek word for "household," one meaning management of the household, the other meaning knowledge of the household.

Economics in Context diagram: simplified model showing the environment with energy and material sources and sinks as essential components of an economic system.

Efficiency: *traditional* economics definition — producing the most goods at least cost; *ecological* economics definition — accomplishing the most work with the least use of energy.

Elasticity: in markets, elasticity refers the ability of supply (production) and/or demand (consumption) to increase or decrease as prices change; in a monetary system, elasticity refers to the ability of the money supply to adjust to an increase or decrease in the level of economic activity.

Environment: the surroundings of an organism, species, or biotic community.

Ethnocentric: view or perspective that knowingly or unknowingly evaluates other cultures and societies based on preconceptions originating in one's own culture.

Externality: a cost or benefit not paid for by the buyer or seller in a market exchange. Excessive negative externalities (costs) are one of three main market failures.

Federal Funds Rate: the interest rate changed by the U.S. Federal Reserve Banks for loans to member banks, formerly referred to as the "rediscount rate."

Federal Reserve System (the Fed): the central banking system of the United States created in 1913. In the U.S., the Fed determines policies for managing the monetary system.

Feedback mechanisms: processes in a system by which changes are modified by their results or effects. Systems analysis identifies two types of feedback mechanisms.

***Positive* feedbacks** accelerate the process of change and create self-reinforcing cycles that can potentially destabilize the system.

***Negative* feedbacks** moderate the process of change and create self-regulating cycles that can maintain balance and stability within the system.

The concepts of positive and negative feedback tend to be *counter-intuitive* because positive feedback in a system often produces consequences that humans view as negative, and negative feedback often produces consequences that humans view as positive. Positive and negative feedback in system analysis is quite distinct from, and often different from, its positive or negative consequences for people.

Positive feedback in the form of mutual affirmation in human relationships strengthens relationships. In science and technology, innovations tend to multiply. But positive feedback also tends to destabilize a system and can intensify outcomes we view as harmful, as with a "vicious cycle." In the climate system, melting tundra releases methane, a powerful greenhouse gas, thus accelerating a warming trend. In a sound system, positive feedbacks can create an intense squeal. In a chemical chain-reaction positive feedback creates an explosion. In an economy it accelerates both expansion and contraction.

Negative feedback maintains system balance, as with a thermostat in the heating system of a building; or as in the climate system with the tendency of plants to grow faster with higher carbon dioxide concentrations, thus increasing the rate at which vegetation absorbs carbon dioxide. Negative feedbacks are what Boulding called "homeostatic mechanisms," that help match supply and demand in markets, but are missing and needed in industrial market economies as whole systems.

Finance: the management of money by individuals and households, businesses including private financial institutions, and government; in economics "finance" often refers to private financial institutions as a sector of the economy as a whole.

Financial economy: the *real economy* produces tangible goods and services; the *financial economy* produces various forms of legal claims on real wealth.

Fractional reserve banking: the practice in banking of keeping only a fraction of the money received as deposits in reserve to cover possible withdrawals, and loaning the rest. This process creates "bank money" and has a multiplier effect on the money supply as it is repeated through successive loans and deposits.

Goods and services: what an economy produces. Goods are things; services are activities; both have monetary value as determined by the process of buying and selling in markets.

Inflation: when prices rise either because "too many dollars are chasing after too few goods (*demand-pull*) or because an increase in the cost of one or more factors of production leads to a general rise in prices (*cost-push*).

Note: There is some irony in the assumption that inflation is a bad thing which government should prevent when it is widely understood that there are externalized costs not included in prices which government policy should address, and that the effect of addressing them is to increase the prices paid by consumers.

Interest: the cost of borrowing money, usually based on a percentage of the amount borrowed for a period of time.

Investment: savings used for the production of new capital.

From a *macro-economics* perspective, an investment must be new business or government spending for a new machine, building, road, or other infrastructure that increases productive capacity.

A *personal financial investment* may yield a financial return but it doesn't become a societal investment until it leads to new productive capital.

From an *ecological economics* perspective, an investment is spending to maintain and increase the productivity of any capital stock, which includes forests, fields, institutions, and communities, as well as factories and equipment..

Keynesian analysis: a macro-economic, "activist" perspective originating with the theories of John Maynard Keynes that advocates using actions by government as a countervailing force to correct for positive feedbacks in market activities. *Fiscal policy* (taxing and spending) and *monetary policy* (managing the money supply) are the two basic tools of this perspective.

Liquidity: the ability to exchange an asset for currency.

Lithosphere: the earth's crust below the biosphere, which is not inhabited by life (Most landfills are part of the biosphere, not of the lithosphere.)

Market: the process by which buyers and sellers exchange goods and services for currency, i.e. the real or virtual space where buyers and sellers meet, and prices adjust until supply equals demand. Individual markets exchange money for a particular good, service, property or financial instrument. To function well, markets must involve many informed buyers and sellers.

Market benefits: there are three well-established benefits: voluntary exchange; efficiency in the allocation of resources to give consumers what they want; and increased productivity of labor through specialization and innovation.

Market concentration: the tendency in markets for successful businesses to "win" by expanding to eliminate or control competition and thus dominate a market. Excessive market concentration occurs when one or a few buyers or sellers increase profits by distorting prices because they have been able to reduce or eliminate competition.

Note: There is some irony that many companies are strong advocates for competitive markets while they pursue business strategies to reduce or eliminate competition.

Market failures: What markets cannot provide that should not be expected of them, among which are restraining negative externalities, supplying public goods, and restraining excessive market concentrations.

Market failures in economic theory are not to be confused with a business failure. The failure of a business to succeed in competition with others is viewed as a benefit for consumers and for the economy as a whole because it eliminates inefficient production.

Macro-economics: One of the two main branches of modern economics which focuses on the interactions among consumers, producers and government that determine the overall level of economic activity on regional, national and global scales.

Micro-economics: One of the two branches of modern economics which focuses on specific markets and how they are affected by the interplay of choices made by consumers, producers, and governments.

Monetarist/neo-liberal analysis: an economic perspective that advocates a "minimalist" role for the government. Monetarism developed from the work of Milton Friedman in the 1960's, and holds that government intervention is too cumbersome, inefficient, and burdensome, and tends to reduce

productivity. Economic neo-liberals believe as a principle "that government is best that governs least."

Monetary system: a macro-economic concept based on the interrelated components of how money works in an economy.

Money: a social invention that typically provides three functions: means of exchange in markets, a unit of account, and store of value. Money is created by governments when they issue currency and by banks when they make loans. The value of money depends on the willingness of people to use it as a means of exchange, and on the relationships among the amount of money in circulation, its rate of circulation, and the volume and value of the goods and services exchanged.

Multiplier effect: in the business cycle there is a multiplier effect in overall economic activity as new purchases result in increased production, employment, income, profit, and investment; in the monetary system there is a multiplier effect in the money supply as new loans by banks result in increased spending and deposits in the banking system. There are also reverse multiplier effects if there is a reduction in the overall level of purchases or in bank loans.

Natural Step, The (TNS): a planning framework to promote ecologically sustainable development in business and government.

TNS Principles:

Substances from the earth's crust must not systematically increase in the biosphere.
Substances produced by society must not systematically increase in the biosphere.
The physical basis for the productivity and diversity of nature must not be systematically diminished
We must be fair and efficient in meeting basic human needs.

Negative feedbacks (*see* Feedback mechanisms)

Negative externalities: costs of a good or service to the wellbeing of others or the public at large that neither the buyer nor seller pays for; examples include pollution, road rage, and sprawl.

Neo-Keynesian analysis: a contemporary "activist" perspective regarding the government's role in managing the economy which considers the monetarist critique of Keynes' theories while asserting the need for government action to protect the public welfare from the instabilities of markets.

Neo-Marxist analysis: a normative macro-economic "interventionist" perspective," which sees the exploitation of labor as a major source of business profits, and advocates a strong government role to redistribute wealth and income, and to protect the interests of labor and the unemployed. This perspective focuses primarily on excessive market concentration and profit-seeking as the sources of economic difficulties.

Normative analysis: the approach taken by economists who use theory and empirical findings combined with perceptions and insights based on value judgments to prescribe or advocate particular choices, usually related to public policy. There can be normative analysis in both micro and macro economics.

Note: Economists who use their findings to advocate for particular policies or action alternatives are engaging in normative analysis, unless they make a clear distinction between their findings and their advocacy.

Open system (s*ee* System)

Pollution: from an *anthropogenic* perspective, waste from human activity that is detrimental to human health and wellbeing; from an *ecological* perspective, waste from human activity that exceeds the absorptive and regenerative capacity of an eco-system; from a *biocentric* perspective, waste from human activity that is detrimental to the health and wellbeing of living creatures.

Positive feedbacks (*see* Feedback mechanisms)

Positivist analysis (or positive analysis): the approach taken by economists who use scientific method to quantify as many interacting features as possible, and to predict outcomes that match real-world experience, without making value judgments. Based on "logical positivist" philosophy, positivist analysis seeks to avoid ethical issues, such as those relating to the distribution of income and wealth. When economics is used for policy advocacy, the advocate is no longer using positivist analysis, but is supporting policies that favor some values over other values.

Principles of a sustainable economy: three basic ones: 1) restore and enhance biological productivity; 2) invest in natural capital and develop substitutes for non-renewable resources; 3) provide people everywhere with basic physical and social needs, legal equality, and civil liberties.

Productivity: *traditional* economics definition — the amount of monetary value from a worker's output per hour of work; *ecological* economics definition — the amount of use value created from a given quantity of physical resources.

Propensity to save, and propensity to spend: the level of spending and saving associated with a given level of income. In households, the propensity to save tends to rise as income rises.

Public goods: goods and services from which people benefit without paying anything to use them (except paying taxes in the case of publicly owned goods).

Public policy: local and national laws, regulations, and administration, as well as international agreements. There is theoretical agreement that public policy must correct for market failures and address economic instability, but little practical agreement as to how this should be done.

Renewable energy: sources of energy that are continuously regenerated, mostly by energy from the sun. Hydro-electric, wind, solar, geothermal, and bio-mass are the primary types of renewable energy currently in use.

Renewable sources and sinks (*see* Sources, Sinks)

Reserve Ratio: the fraction of the deposits that banks receive which they do not loan but keep available to provide cash on demand.

Reserve requirement: the fraction of deposits received that governments require the banks they charter to keep as reserves.

Savings: the portion of household income that is not spent on consumer goods and services.

Sinks: where the outputs (wastes) of human economies end up in the earth's systems.

The atmosphere is a sink for industrial carbon. Vegetation, soils, and the ocean are sinks for atmospheric carbon. The lithosphere is a sink for carbon in the ocean. Sinks are renewable if the quantity and/or rate of outputs does not reduce their absorptive capacity.

Sources: where the inputs to human economies come from.

Biological sources are renewable if they regenerate faster than they are depleted or damaged by human activity. Mineral sources are fixed. The minerals can be recycled, but the sources are not renewable on a human time scale. Energy from the sun is renewable. Energy from fossilized carbon is not. Renewable sources can become non-renewable if their regenerative capacity is exceeded by harvesting or otherwise damaged.

Spiraling debt: a positive feedback mechanism that increases unpaid debt due to compound interest, and necessitates more borrowing to pay interest on existing debt (*see also* Structural Adjustment Programs).

Structural Adjustment Programs (SAPs): policies imposed on developing nations by the International Monetary Fund in exchange for monetary assistance. Developing nations often come to the IMF for assistance with spiraling debt. SAPs usually require national budgets to cut social welfare spending to pay the interest on international loans.

Structural violence: indirect physical and psychic harm that results from the way institutions normally function in an economic, political, or social system.

Sustainability: the ability of something to be sustained over a period of time. (*see also* Biological productivity, Ecological niche, Ecological integrity, Renewable sources and sinks)

Questions to ask about any use of the term "sustainability" are: To sustain *what* ? For *how long* ?

In a system, stability is promoted by negative feedbacks, change is promoted by positive feedbacks, and sustainability of the current state, or of the system as a whole, is promoted by the predominance of negative over positive feedbacks.

Sustainable yield: the annual harvest does not exceed the annual rate of growth.

The requirement of a more ecologically sustainable economy is that $\boldsymbol{P \times A \times T \leq SY}$, which is to say that the impacts of human activity on the productivity of the biosphere must not exceed its sustainable yield.

System: a set of things or parts forming a whole.

Closed system: a system that matter, or material composed of molecules, neither enters nor leaves. The earth is for practical purposes a closed system. The only thing that enters is concentrated energy from the sun, and the only thing that leaves is dissipated energy that is radiated into space. It is not possible for a sub-system of a physically closed system to expand significantly without affecting and potentially disintegrating other subsystems and/or the system as a whole.

Open system: a system that both matter and energy enter as inputs and leave as outputs. Human economies are open systems, receiving useful material from the surrounding ecosystem as inputs and discharging less useful materials as outputs back into the surrounding ecosystem.

Throughput: the energy and material resources that flow through human economies from environmental sources to environmental sinks.

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* Quaker Institute for the Future (QIF) was founded by five participants in the 2003 Pendle Hill Gathering and several other Friends, in order to facilitate greater collaboration among Friends engaging in research relating to public policy, and the dissemination of policy recommendations congruent with Friends testimonies to policy makers.