

The Ecology of Commerce Study Guide

The Ecology of Commerce by Paul Hawken

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Plot Summary

The Ecology of Commerce by Paul Hawken deals with the effects of industrialization on the environment. Hawken's takes the point of view that the environment is being destroyed by the economic system. The economic system and the processes of industrialization do not mimic the natural cyclical processes of nature, where the waste in one step becomes the food in another step. In this type of ecosystem, there is no waste; everything is recycled. What is waste in one stage is food in another stage. If industry had mimicked this kind of system there would be no problem with exhaustion of resources and damage to the environment. However, this isn't how industrialization works; instead, the process is linear. Industrial processes result in a great deal of waste, which does great damage to the environment. For example, industry relies on fossil fuels like oil and other carbon-based fuels. This creates a problem with carbon dioxide, which is harmful to the environment.

Hawken presents the idea that the economy must change from one based on waste that causes damage to the environment to one that is a restorative economy. This change must take place in order to save the planet from destruction. This would be difficult to accomplish, however, since businesses in the economic system are based on the profit motive, meaning they use the cheapest production technique. Being environmentally aware is usually more expensive and since this does not help the profit position, it is usually not adhered to. Hawken discusses several environmental disasters, like Bhopal, and the business response to the situation. The multinationals come across as cold and inhumane and concerned only with costs, not with human lives.

In order to save the environment, there must be a change to an ecologic economic system, which would yield no waste. The industrial process will not create any waste that is dumped into the environment. The ecologic economic system will mimic the cyclical processes of nature in which waste from one stage is food in another stage. The ecologic economic system will be based on hydrogen and solar power instead of carbon. The use of fossil fuels results in carbon dioxide problems in the environment, which would be eliminated with the switch from carbon in the production process. Finally, an ecologic economic system will be based on feedback and accountability that will strengthen the restorative nature of the system. Hawken makes the point that this change has to take place for the survival of the planet, but the carrying capacity of the planet is not known. The carrying capacity refers to the amount of population the planet can support and the amount of waste the environment can absorb. Business prefers to use regulation and things like taxes where they don't have to change their production techniques. As long as they can just pay, they don't have to change their production behavior. However, this isn't what is needed for the establishment of an ecologic economic system.



Chapter 1, A Teasing Irony

Chapter 1, A Teasing Irony Summary and Analysis

The Ecology of Commerce by Paul Hawken deals with the effects of industrialization on the environment. Hawken's takes the point of view that the environment is being destroyed by the economic system. The economic system and the processes of industrialization do not mimic the natural cyclical processes of nature, where the waste in one step becomes the food in another step. In this type of ecosystem, there is no waste; everything is recycled. What is waste in one stage is food in another stage. If industry had mimicked this kind of system there would be no problem with exhaustion of resources and damage to the environment. However, this isn't how industrialization works; instead, the process is linear. Industrial processes result in a great deal of waste, which does great damage to the environment. For example, industry relies on fossil fuels like oil and other carbon-based fuels. This creates a problem with carbon dioxide, which is harmful to the environment.

"I have come to believe that we in America and in the rest of the industrialized West do not know what business really is, or, therefore, what it can become," Hawken writes (Chapter 1, pg. 1). Society's knowledge of business is primitive in terms of what creates a healthy environment and what the role of commerce is. The end goal should not just be to make money or produce or sell products. The purpose of business should be to increase welfare for society.

Business is at the crossroads of change. The new business of the future will be unrecognizable when compared to the businesses of today. They will have the ability to protect the environment and restore ecosystems. Today's businesses are in a transformation period. The current businesses fail to see the error and lingering effects of destroying forests and dumping wastes. They don't see any compatibility between ecology and business. The policy of today balances the needs of industry with the needs of the environment. What Hawken envisions is an economy that merges commerce and ecology into one unit for production and distribution. Years ago this wasn't important because it seemed that the earth's supply of resources was almost endless. However, resources are not infinite in supply and we now see that they are being depleted at an alarming rate. In addition, pollution and toxins affect mankind adversely. For example, many animals and birds are dying off. This is alarming because what affects the endocrine and immune systems of animals and birds also affects the endocrine and immune systems of humans. The slower reproductive rate of humans just means that it takes longer for the effects to show up.

Businesses are not oriented to the problems faced by mankind. The business frame of mind is that all problems can be solved through finance, growth, and research and development. What businesses don't realize is that they are selfishly stealing the wealth of the future for the use of today's generations. Hawken claims that business as we know it is over. It must change to meet the needs of the world. Businesses today



operate across national borders with the belief that the world benefits from commerce and free markets. When industry developed, science was not advanced enough to inform society of the effects of industrialization.

The destruction caused by businesses cannot be easily replaced with the current tactics. If companies try to behave properly they go out of business. Hawken sees the present state of business caught in a quagmire: If it doesn't keep growing, it expires. At the same time if it keeps growing it destroys the environment. In this book, Hawken proposes a new way to avoid this conflict. The wealth of businesses must be based on the cyclical processes and principles of nature. Hawken introduces the term *biological accounting*, which deals with this like life and ecology. Government cannot create wealth; only businesses can. In Hawken's framework the restoration of the environment would be tied to making money. They would be a part of the same process.

Businesses take, make and waste. What they waste translates into food. In an ecological model, all wastes would be recycled or reused in some way. The energy of the sun must be tapped and nature must be duplicated in its variety. Some firms are ecologically concerned and pay higher prices for their inputs, like lumber, to ensure that the timber is replaced. Most prices in the economy do not take ecology into account. This lack prevents restoration from taking place. Hawken talks of the restorative economy in which competition is based on saving resources.

In terms of the environment, business is the problem. Since it is the problem, it must also be a part of the solution.



Chapter 2, The Death of Birth

Chapter 2, The Death of Birth Summary and Analysis

When an area of land is cleared it is quickly taken over by weeds. They compete for sunlight and represent an inefficient use of resources, changing the environment. This is called negentropy. The immature ecosystems evolve and develop and become highly complex. They become mature and efficient and reach a state of equilibrium from which there is little change. Clearing the land for agricultural use involves changing this climax system into a system for production of crops.

Hawken describes the industrial economy as an immature ecosystem. The economy uses resources in a way that mimics the use of sunlight stored in plants and fossil fuels. It acts as a newly formed ecosystem and functions as a "linear industrial ecology of low information quality" (Chapter 2, p. 21). GNP increases without any index accounting for the effect on the environment. To do so requires dealing with what businesses take, make and waste. This chapter is concerned with the first concept.

Hawken compares business to an organism in that it takes food and energy from the environment. The business, unlike the living organism, also uses nonrenewable resources like oil, coal and natural gas, which cannot be replaced. Renewable forms can become nonrenewable if they are over-exploited and used up too quickly. This is what happens with economic progress. A measure of the effect on the ecosystem is called net primary production of the planet or NPP. This is defined as all of the sun-using photosynthetic production less the amount of energy that is needed for the support of the photosynthetic plants. Man uses 40 percent of this output per year. The greater the increase in the population, the greater the increase in the percentage of NPP that is used. This results in the extinction of many species that can no longer compete for food. It takes more chemicals to grow smaller amounts of food.

Man is currently borrowing from the future to sustain current consumption levels. As ecosystems and habitats are destroyed, various species become extinct. Resource shortages and depletion lead to violence. It doesn't take long to completely deforest a nation. Extinctions of species used to be caused by catastrophic events. Now, extinction is caused by mankind. Once a species is extinct, it doesn't come back. There is no exact knowledge of how many different species exist on earth and how many have become extinct. The extinction of species is most prevalent in the tropical rain forests, which are rapidly being destroyed for lumber. Many species cannot reproduce and are dying off. This is what Hawken calls the death of birth. Once an ecosystem is violated, such as by introducing detergent into a lake, the process of destruction that begins self-feeding and can't easily be stopped.

Protecting the environment costs money. This money results in lower profits for corporations so they are reluctant to take the necessary precautions to protect the environment. Businesses look to technology to solve environmental problems. The

reliance on markets and technology to solve the problem of extinction of species worries ecologists. No technology can replace the fossil fuels that took nature millions of years to create. Economics does not account for the destruction of industrialization on the environment and the destruction of various species. Businesses do not have to account for the fact that their present actions have an effect on the future. The problems lie in the nature of the economic system that does not tabulate the costs to the future. An economics system that accounts for these kinds of costs is what is needed.



Chapter 3, The Creation of Waste

Chapter 3, The Creation of Waste Summary and Analysis

Waste is created by the process of industrialization. Wastes remain in the environment and the environment's ability to deal with waste is limited. The myths created only propagate the problem. Transferring wastes to a different environment, like a landfill, does not solve the problem. The problem is not the disposal of the wastes; it is the actual creation of the waste that is the problem. They do not mimic nature. Wastes, in nature, are food for other forms of life. There is basically no waste in nature, unlike industries that are linear systems that use up resources.

Many forms of toxic wastes are due to disposable diapers and polystyrene. These are organochlorine compounds that produce dioxins, which release chlorine gas. These compounds take hundreds and thousands of years to decompose and cannot be used by any other life form as food. They accumulate in the fatty tissues of organisms and are not expelled. The only form made in the ocean, called chloromethane, is vital to atmospheric ozone. These compounds cause cancer, infertility, birth defects, stillbirths and immune suppression problems in humans. The long-term effect on humans and future generations is still unknown. "The implication of recent studies on effects of these compounds on human development is that we have within the human race a biological ozone hole, a series of chemical compounds whose effect will expand throughout the entire world population for decades, even if all such compounds ceased being manufactured today," writes Hawken (Chapter 3, pg. 43). The use of these compounds is beyond the human tolerance level and can result in genetic alterations. How long this can go on before life, as we know it, is altered is unknown.

The use of landfills is appealing to industry because it allows them to continue in the present state. It allows them to avoid facing the problem of creation of waste. There is no known technology to deal with toxic wastes. They don't know how to detoxify the wastes that are stored in toxic waste dumps. Incineration results in the creation of more dioxins. Despite all the money the government spends, it is not halting the destruction.

Business feels that environment concerns can only be dealt with when they are prosperous and beneficial to them. They are a very low priority. It would be logical to redesign industry so as not to create waste. Industry sees it as redesigning the environmental standards. Part of the problem, as seen by scientists, is the lack of available data. Many chemical manufacturers do not release their production information to the public, so scientists that are trying to study the problem can't obtain the data they need. Companies claim that many preventive measures are cost prohibitive and no matter how it is viewed, they are still replacing the cyclical processes of nature with the linear system.



Chapter 4, Parking Lots and Potato Heads

Chapter 4, Parking Lots and Potato Heads Summary and Analysis

It doesn't seem to bother businesses that the welfare of the ecosystem is viewed separately from business and jobs. "What is required is a total redesign of what it means to be in business at the latter stages of the twentieth century, when science can tell us clearly and without doubt that our present course of action is extinguishing life on earth," says Hawken (Chapter 4, pg. 58). There are ways that businesses can act that serve the purpose of restoration in terms of the environment.

Society is stuck with a bill from past generations for the damages that have been done. These bills have to be paid in order to save the planet. The amount of money spent on the Cold War would have replaced the world's infrastructure. Businesses must change. They cannot expect the world to change in terms of environmental damages. They have the responsibility to become restorative. A good example of this is 3M, a company that stepped up to this challenge in 1975 with its 3Ps program in an attempt to eliminate pollution out of its production process. 3M saved half a billion dollars over a 15-year period. Environmental planning is now a part of all business planning.

Restorative businesses are exemplified by the effort in Kalundborg, Denmark. A power plant sends its excess heat wastes to other businesses that use it as power. Each business sells its wastes to another business that uses it as an input. This all came about as a result of private cooperation without any government involvement or plans. Hardin Tibbs feels that industry should adjust its inputs and outputs to an amount that the environment can carry. Tibbs is an advocate of industrial ecology on an international basis. There are two methods discussed. The first is the imposition of a Pigovian tax to discourage production. The second is the sale of pollution permits. Under this method, the entity would be allowed a certain amount of emissions per credit in the permit. Companies could sell credits if they don't require all of the credits, i.e., low polluting companies would sell the unneeded credits to high polluting companies.

In Germany, Braungart and Englefried propose intelligent products and hope to bypass the waste management issue entirely. This means eliminating waste through the production process. They have three classifications of products: consumables, service products and unsaleables. Industrial production would fall under the consumables and service products categories. A consumable is a product that is used and then becomes a waste that is used for food for another organism with no waste or toxic hazard. Current products like shoes and clothing that aren't degradable would have to be made degradable. Service products are both durable and non-durable goods depending on the item. These products would be designed so they could be re-cycled. People who need new consumer goods trade in the old ones, which are recycled so manufacturers

have to be concerned with how to use the old products when they design new ones. Unsaleables have to be designed out of the production process. In the meantime, those that are stored in dump sites should have storage charges that the business must pay until a method is developed to get detoxify them. It is a cradle to grave concept.

Chapter 5, Pigou's Solution

Chapter 5, Pigou's Solution Summary and Analysis

The problem for the environment is that the market does not tabulate the costs of damage to the environment. The market only tabulates the costs of production and prices are based on the costs of production. Because of this, free markets are not beneficial to mankind. Gasoline does not include the price of smog, acid rain and other forms of pollution and their effects on humans. These costs are called external costs or spillover effects. In spite of this, free markets represent the form of economic system that is best in creating wealth.

The economy may be operating at an optimal level but there is still destruction of the environment taking place. The destruction occurs because external costs are not a part of the businesses' costs of production. These external costs must somehow be included in the costs of production so they are part of product price. One way to include the external costs is with a Pigouvian tax equaling the amount of the external costs. There are two kinds of costs that must be identified. First, the cost to the entity or place that is not involved in the production or the spillover cost. Second, the long-term cost and implications on future generations. The criticism of this method is that the polluter pays the tax but can still engage in the activity without cutbacks. These kinds of costs are not easy to measure. Hawken feels, however, that some attempt is better than none.

One of the big problems for the economy is industry's reliance on carbon and carbon-based fuels. The use of these products results in high levels of carbon dioxide in the environment, which alter the environment. This is why they have emission regulations for automobiles. Carbon dioxide traps heat within the atmosphere and contributes to global warming. The fuels that are used are the cause of the problem. Not only is their supply being exhausted but there is no form of recycling for the environment to absorb, so the result is environmental damage. This requires a restorative process which the economy does not yet have.



Chapter 6, The Size Thing

Chapter 6, The Size Thing Summary and Analysis

There are two problems in the modern economy: size and scale. These problems function as a barrier to the establishment of taxes and a restorative economy. The distinction between large and small is \$100 million in sales. Markets today are global and many companies are multinationals. It is easy for firms to shift money around the globe. Most money in financial markets in the world is used for financing multinational activities and growth. Corporations don't care about habitats or ecosystems. They care about the money they makes.

External costs are not a part of production costs or prices. The more externalization occurs, the more profitable the country is. Internalization of costs can be brought about by a Pigouvian tax. Hawken examines the function of the General Agreement on Tariffs and Trade (GATT). The GATT is a body of international traders whose purpose is to promote free trade. As such it has very strict policies and rules for the reduction of tariffs, such as equal non-discriminatory treatment of members and products. It also has rules against export controls and sponsor rounds of multilateral trade liberalization.

In today's world, nations can avoid the regulations of one country by producing in a different country. The second country then adopts the same practices as the company in the first country, which accelerates the whole process. An example is cigarettes. GATT's policies sometimes come into conflict with national policies over resource conservation and other things. In some cases replanting trees taken by lumber companies is viewed as a subsidy and in conflict with GATT.

When the GATT was created following World War II, its purpose was trade liberalization, not conservation of the environment. Its rules are designed to promote the liberalization of trade and to treat nations equally. This is where it runs into criticism from Hawken because it functions at cross purposes to procedures for the environment.



Chapter 7, Private Lives and Corporate Rights

Chapter 7, Private Lives and Corporate Rights Summary and Analysis

There is an unbalanced and unequal relationship between authority and governance, meaning there is a distinction between private lives and corporate rights. The old state charter companies that sailed to the New World were forms of corporations that absorbed risk of damage during a storm and allowed for speculation. Corporate charters through the years have had various purposes. Some early charters were restrictive and granted very specific limited rights. After the Civil War, the rights of corporations grew as a corporation was given the same rights and responsibilities as a person.

The Clean Air Act of 1970 resulted in the Environmental Protection Agency. The oil refineries spent millions of dollars fighting the provisions of this law. Along with the

American Enterprise Institute, they published articles showing how cost-ineffective the stringent standards were. Science can now tabulate the costs of the effects of chemicals and the likelihood of disease. Businesses know the cost of abatement, which is why they can calculate the cost to human life and health. Some industries, like tobacco, spend millions of dollars to defeat legislation detrimental to the business. In 1992 legislation proposed to eliminate the tax deduction for advertising and promotions of tobacco, bringing about protests from other senators who were receiving financial aid from the tobacco industry.

Towns and cities that ban pesticides or impose tighter standards than those mandated faced court challenges from the chemical companies. Companies have fought the attempts to restrict the use of chemicals because of the effect on their profits. Writes Hawken, "According to Russell Mokhiber, author of *Corporate Crime and Violence*, corporations kill 28,000 people and seriously injure 130,000 every year by selling dangerous and defective products" (Chapter 7, pg. 118). Many cancer deaths and other illnesses are caused by substances encountered at work. Most people believe that businesses are willing to harm and endanger humans in order to increase profits. The abuses by businesses are discussed in the chapter, pulling from examples from Bhopal, to the PCBs in the Hudson River to the Exxon *Valdez*. The fact that businesses are responsible for damage to the environment and humans is documented. These corporations still have their rights to do business. They are still more responsible to their stockholders than they are to mankind.



Chapter 8, The Jesse Helms Citizenship Center

Chapter 8, The Jesse Helms Citizenship Center Summary and Analysis

This chapter begins with the premise that individuals in a corporation behave as addicts do. They are addicted to their corporation. Corporations have been cutting back on staff and employees become victims whether they keep their jobs or not. Many are approaching the burn-out stage. In the future people will have to work hard to have less leisure time. "In fact, the 1980s could be seen as a financial end run around the simple economic truth that prosperity can only come from adding value," writes Hawken. "We have reached a point where the value we do add to our economy is now being outweighed by the value we are removing, not only from future generations in terms of diminished resources, but from ourselves in terms of unlivable cities, deadening jobs, deteriorating health, and rising crime. In biological terms, we have become a parasite and are devouring our host" (Chapter 8, pg. 126). Workplace stress is reaching alarming levels. The standard of living has not increased in the last 20 years and neither have real wages.

How long will a company last if its employees see its product as dangerous to man? A company is run by ordinary people and has a legal staff that is bigger than its personnel department. The company's purpose is not to intentionally harm people, but given its state of knowledge, it may do just that. Additionally, acting as a group people will do things that they wouldn't do individually. This is how they explain corporate reaction to environmental disasters that harm human life. The corporate executives take a coldly calculated approach.

Society used natural energy, captured by food, wood and wind, long before the Industrial Revolution. Somewhere along the line, society switched to using stored energy to power its machinery and equipment. Since then, there has been waste and man has not been in sync with the cyclical processes of nature. One thing that helps contribute to waste is advertising. It persuades people to buy things that they normally wouldn't buy which help out the companies that are producing them, leading to more waste. In spite of this, the dichotomy between rich and poor nations continues to widen.



Chapter 9, The Opportunity of Insignificance

Chapter 9, The Opportunity of Insignificance Summary and Analysis

Not all businesses are big; some are small. "One of the purposes of the restorative economy is to ensure that innovative commercial options have a chance to survive in the monoculture of corporate capitalism," argues Hawken (Chapter 9, pg. 137). Many small businesses don't survive, but those that do are characterized by undercapitalization and existing at the margin. The small businesses that survive are usually the tough competitors. Businesses should want to provide tasks or services that are produced sustainably, meaning in sync with the ecosystem. The product doesn't result in damage or waste to the ecosystem.

It is easier to begin a business that conforms to these practices than it is to change an existing business. For a company to be a part of the restorative economy, it must improve people's lives with its products. Hawken uses health care as an example. The majority of trips to a physician result in the prescribing of medicine and the development of medicines is open to only the biggest companies to the costs involved. Consequently, most of these drugs aren't available in developing countries until the patents expire.

Medicine, especially preventative medicine, is a developmental business and a small business that can be practiced anywhere.

Energy can also be a growth or development industry. Most of our energy comes from oil and we've already fought wars over it. Energy is also available through conservation. Most of what we use, however, is oil, coal and nuclear which are all growth industries. They all require large capital investments. Energy conservation is a development industry and usually done by small entities. The more self-sufficient a community is, the better off it is. Small locally owned businesses make it easier for them to be more responsible ecologically. A business that is sustainable is a business that is responsible for the effects on the environment. It is a business that makes things that are not harmful to future generations.

Chapter 10, Restoring the Guardian

Chapter 10, Restoring the Guardian Summary and Analysis

Installing energy saving devices and mechanisms allows people to take tax credits if they have enough income to do so. Lower income entities do not enjoy the income or the tax breaks that the middle and upper income classes do. The lower income brackets sometimes see energy savings measures as an infringement on their lifestyles. Any such pro-ecology movement must take place from the bottom up in order to be successful. Jane Jacobs maintains that there are two different systems at work here. One is the guardian and the other is the commercial. The guardian system is basically one of governance. The virtues of one system become the vices of the other when they mix and the system of governance does not have the efficiency of the commercial system. This occurs when one tries to take on the functions of the other, when government tries to run a commercial enterprise or when a commercial enterprise tries its hand at governance, such as regulation.

Businesses must internalize the external costs of the spillovers. Many times they try to do things in the cheapest way possible and end up causing damage. Many times the damage is a result of poor design. Businesses often challenge any regulatory standards rather than just comply and try to better. Businesses must not try to control the guardian. One way of internalizing the external cost is through green taxes. These taxes shouldn't burden the lower income brackets and could provide the source of most government revenues. These taxes can take all kinds of forms. They can be landing fees, charges on waste water, etc. The OECD countries have 85 different taxes that are related to the environment. These taxes are a way of paying for environmental monitoring. They are not an alternative to regulations. Green taxes are basically a way of maintaining the status quo even though they have some hope for the future.



Chapter 11, Pink Salmon and Green Fees

Chapter 11, Pink Salmon and Green Fees Summary and Analysis

Economists and ecologists differ on their measure of efficiency. Economists measure efficiency in terms of dollars or money. Ecologists measure efficiency in terms of thermodynamics and resource conservation. There are still areas of agreement between the two groups. Whenever there is waste, there are higher costs. A reduction in inefficiency means lower costs and therefore less waste. According to Hawken, "Because efficiency should be the common ground between economics and ecology, it represents the bridge to a restorative economy" (Chapter 11, pg. 179). The purpose of energy taxes is to lower the carbon dioxide levels. This is in response to fears about global warming. The purpose of green taxes is to increase the costs high enough to stop the damage. Solar energy is cleaner than the carbon dioxide forms of energy and does not pollute. Hawken says that are two paths. Strategic planning is based on the idea that one can shift to the second path if the first path proves to be wrong.

Green taxes can be used in many situations. They are especially useful on tobacco, guns, alcohol and ammunition. These are the big problem causers so these items should be subjected to the taxes. Without prices, products and resources tend to be overused. What if there was an oil utility like the Arctic National Wildlife Refuge (ANWR) which has a six-month supply of oil? Taxes would be imposed on the gas use of cars with cars with better mileage paying lower taxes than cars with poorer mileage. What is needed is one industry to invest in another, like the oil industry investing in the car industry to help produce more efficient cars or a low energy using refrigerator.

Conservation measures cannot work if the government keeps entering into trade agreements that reward companies for externalizing costs in their overseas operations. Most businesses don't want any changes. They want the programs that propagate the status quo. This allows them to continue to operate and earn profits. They don't have to redesign their production processes to eliminate waste.



Chapter 12, The Inestimable Gift of a Future

Chapter 12, The Inestimable Gift of a Future Summary and Analysis

Even though they want people to think in terms of what is good for the world, who is any one group to impose their wants on other cultures? Even though they will say that the environment is important, government does not acknowledge the significance of environmental problems. Man either has to take part in the restoration of the planet or vanish from it. The planet only has a certain amount of carrying capacity, which is the ability of the planet to support a certain amount of population and absorb waste. The earth's carrying capacity is still unknown. Optimists believe that everything will work out okay in the future.

Today's technology uses resources at a faster rate. Some hope that technology will find a way to eliminate the threat to the environment. Then there are the dire predictions of Thomas Malthus to consider, which suggest that the size of the population is limited by the food supply. When there isn't enough carrying capacity, there are famines. This is what happens when there are increases in the population without increases in carrying capacity.

Hawken proposes three methods that follow nature. The first is to follow the waste-equals-food principle, which is to eliminate waste from industrial production. This puts production in sync with the cyclical processes of nature instead of industrial production being linear. This means designing methods and systems that do not have any waste associated with them. The second method that Hawken proposes is to change from the current methodology based on carbon to a methodology based on hydrogen and solar energy. Carbon is the cheapest method. These are the fossil based fuels that we use that result in carbon dioxide emissions. The third method proposed by Hawken is to create systems based on restorative behavior. Each of the three methods aims to lessen the impact man has on the environment. Industrialism as we know it must end. The question that must be answered is how to organize the economy. Most agree that they don't make major changes in the economic system because they don't know about the dangers that are ahead.

The solution to the problems must be addressed by all levels of society, not just a Congress that is supported by PAC monies. All kinds of people should be involved. The result of such action, according to Hawken, is invaluable. "The creation of a new story for America, a recovery of the common would insure that once again life is celebrated on earth." Chapter 12, pg. 219.



Characters

Paul Hawken

Terry Erwin

Dennis Meadows

Herman Daly

Dr. Karl-Henrik Robert

Joseph Ling

Hardin Tibbs

Dr. Michael Braungart and Justus Englefried

Nicholas Pigou

Wendall Berry

Jane Jacobs



Objects/Places

Amazon Rain Forest

The rain forest is the site of the project by Erwin in which he counted the number of beetles in one species of tree and then estimated the number of different kinds of trees and the number of different species of beetles and other insects in the Amazon.

Denmark

Kalundborg, Denmark is the site of a restorative business system of the kind that Hawken envisions. A power plant converts waste into steam which it sells to other companies and each company in the chain sells its waste output to another company that uses it as an input.

Bhopal, India

Bhopal, Indian is the site of the chemical accident that killed and damaged the health of 200,000 people. Union Carbide's behavior was unethical and immoral but not illegal.

San Francisco, California

The San Francisco Bay area is where there is intense road congestion. In spite of all of the freeways, rush hour still moves at fifteen miles per hour. This is a situation that might benefit from green taxes.

Pacific Coast of the U.S.

The Western states of Washington, Oregon, California and Idaho are the home of now extinct salmon runs.

Industrialized West

This term refers to the major industrial countries of the world. It obviously includes the United States and Europe.

The North

This term refers to the developed countries of the world.

The South

This term refers to the less developed countries of the world.

Environment

The environment is the object of the book in that it is being destroyed by business and the waste of the industrial system.

Economy

The economic system is based on competition. Competition is based on efficiency or producing at the lowest possible cost in order to maximize profit. This results in damage to the environment due to the techniques of production and the wastes of industrialization.



Themes

Environmental Dangers

The most obvious theme of the book is the amount of damage to the environment and the dangers that it poses for mankind. Environmental dangers result in the extinction of various species, and many species have already become extinct due to man. Every species is a part of the ecosystem and each species has a role in the overall system. When a species becomes extinct, it doesn't exist anymore and can never be replaced. Its function is missing from the ecosystem when it becomes extinct. When enough species become extinct enough functions will eventually be missing from the ecosystem to result in a change. These changes result in damage to the environment that can't be fixed.

These environmental damages come from the industrial waste. Industry does not mimic nature in its cyclical processes. These cyclical processes in nature mean that there is not waste that damages the ecosystem. The wastes of one stage are used as food in another stage. This does not result in damage to the ecosystem or any environmental damage. It is when there are wastes, like toxic wastes that cannot be absorbed or dealt with by the system that there is damage to the environment. It is the nature of industrialization that leads to this kind of damage. The damage to the environment will not stop unless there is a concerted effort to stop it. This will require a new kind of industrial process that mimics the environment in that it does not result in waste. If drastic measures are not taken it is possible that man will eventually be the specie that is made extinct.

The Role of Business

Business is the entity that is responsible for the damage to the environment. Businesses are the part of the economic system based on profit. In a system that maximizes profits, this means that costs must be minimized. If costs are minimized, then there is no concern for the environment because concern for the environment costs money. The problem with businesses is that the cost of damage to the environment and damage to human life is not included in the costs of production. It is a cost that is not tabulated by the costs of production. These are known as external costs or spillovers. If businesses had to be accountable for these external costs, they wouldn't produce as much of the good and wouldn't do as much damage to the environment.

One of the solutions is to impose a green tax which would approximate the external cost, resulting in higher production costs for the business. The problem is that the business may keep producing the same amount and doing the same amount of environmental damage, and just keep paying for it. The green taxes do not force a switch to another technique of production. What is needed is a new design in the industrial process itself. The system must be redesigned so that it mimics nature and



eliminates waste. The elimination of wastes from the industrial process will eliminate the damage to the ecosystem and create what Hawken calls a restorative economy. For businesses to be environmentally responsible will take a new kind of industrial system, or what Hawken calls the ecologic economic system. Hawken sees this as the only hope that the planet has given the damage that is done by businesses. A business that tries to do something on its own incurs higher costs and cannot be competitive.

The Need for Change

Hawken makes the point throughout the book that change is needed if the planet is to be saved. Businesses need to change their industrial process. Waste needs to be eliminated so we don't have all of the damage to the environment that we have as with toxic wastes. Businesses have to be more concerned with the environment than with costs and with the whole bent of the economic system in current circumstances, it can't be. Being concerned with the environment represents a cost that is not included in the costs of production, which basically means that it is a cost that the firm does not know about directly. These spillover costs or external costs are difficult for the firm to internalize and deal with.

There are several ways of trying to have the firm internalize these costs. There are pollution permits that the firm must buy in order to be entitled to emit a certain amount of pollution. Firms that have low levels of pollution can sell their permits to higher polluting firms. Another way is through green fees and taxes. This is the so-called Pigouvian tax that approximates the external costs. They can also impose regulations that require pollution abatement measures. However, none of these eliminate the waste in the industrial process.

The change that Hawken talks about is one in which the industrial process itself is changed. The ecologic economic system is one that mimics the cyclical processes of nature in which the waste in one stage is food for another stage. The elimination of waste in the production process and the elimination of carbon usage in fuels will result in the kinds of change that Hawken says is needed.



Style

Perspective

Paul Hawken is the author of several books and the owner of several different businesses. His idea for this book originated when he received an environmental award for one of his businesses. Hawken began thinking about the award and decided that his company didn't really deserve it. This book is the result of his thinking about the environmental problem and what needs to be done and why. Businesses are the problem for the planet. Even if every business engaged in conservation and abatement measures, it would still not stop the degradation of the environment. There is a flaw in the system itself that needs to be redesigned. This flaw leads to the exhaustion of resources and the creation of industrial wastes.

Hawken feels that there is a need for a new kind of industrial system where waste is eliminated from the production process. This requires the cooperation of all individuals and businesses. This book is written for all of those individuals and businesses. The environmental problem and the destruction of the planet is a concern for all. Regulation is not enough to solve the problem. This book is enough to make people think about what is happening and how and why it is happening. Everyone has to do their part to contribute to a restorative economy. That is one of the points of the book.

Tone

The book is written in the third person. It is a good presentation of the facts. Hawken is obviously the narrator with his points of view being presented throughout the book. He explains what is wrong with the present system and what is required to correct the problem. The role of business is central to the issue of the problem and the solution.

If the book is somewhat alarmist, this is Hawken's point. Businesses in the economic system are the cause of the environmental problems. The economic systems functions on the basis of profits and this means that businesses must be concerned with lowering costs. This is why environmental issues are not high on the business agenda because they higher cost. Hawken makes a point that extinction of various species is a regular part of business life. Every species has a function as part of the ecosystem. Extinction of a species, whether it is a bug or fish or other organism, represents extinction of a function in the ecosystem. Hawken makes the case that all of this is due to man and man is a species that can also be extinguished ultimately from damage to the environment, like the ozone hole. Hawken wants businesses and people to wake up and see the problem. It is not going to go away by itself. He looks at various measures that can be employed and says that the only viable solution is a new ecologic economic system which eliminates the production of waste and dependence on carbons. This is the point of the book and the book makes the reader think about the present course of things.

Structure

The structure of the book is relatively simple. There are twelve chapters. The chapters at the beginning are basically concerned with defining the problem and the extent of the problem without elaborating on the various environmental disasters. Hawken presents a list of viable alternatives that can be used to obtain the various environmental objectives that he presents. There are a few chapters where he discusses how some of the objectives can be achieved. The structure Hawken uses works well for the book.

The book is written in a language that is understandable to the average person. Economic and scientific concepts are explained in everyday language for the reader so the reader can read the book without requiring any special knowledge of economics and science. Terms are readily defined for the reader. The points that Hawken makes are not elaborated on. He makes his point and then moves on to the next issue. There is no overkill. Hawken is not trying to scare the reader, although the book might leave a different impression on the reader is Hawken did take this approach.

The extent of Hawken's research is evident by the quantity of Notes he presents. He used various books, notes, reports and articles in the writing of his book and the material is well documented so the reader can easily look up material in the Notes section. The book is quite readable for the average person without much in technical terms and jargon. The reader will appreciate the readability of the book.

Quotes

"The problems to be faced are vast and complex, but come down to this: 5.5 billion people are breeding exponentially. The process of fulfilling their wants and needs is stripping the earth of its biotic capacity to produce life; a climactic burst of consumption by a single species is overwhelming the skies, earth, waters, and fauna." Preface, pg. vii

"Given current corporate practices, not one wildlife reserve, wilderness, or indigenous culture will survive the global market economy. We know that every natural system on the planet is disintegrating. The land, water, air, and sea have been functionally transformed from life-supporting systems into repositories for waste. There is no polite way to say that business is destroying the world." Chapter 1, pg. 3

"What is the logic of extracting diminishing resources in order to create capital to finance more consumption and demand on those same diminishing resources? How do we imagine our future when our commercial systems conflict with everything nature teaches us?" Chapter 1, pg. 5

"At the dawn of the Industrial Revolution, a vast new world of apparently unlimited natural resources became available for the taking. By constructing an economy that demanded ever-increasing supplies of all resources, but particularly energy - specifically, sunlight stored in the form of timber, plants, and fossil fuels - human successfully mimicked the processes of a newly formed ecosystem. We emphasized untrammled growth and didn't worry about efficiency, conservation, or diversity. In technical terms, we set up a 'linear' industrial ecology of low information quality." Chapter 2, pg. 21

"What concerns ecologists is that extinctions are a direct indication of ecosystem health, which bears directly on our own survival." Chapter 2, pg. 27

"Business, despite its newly found good intentions with respect to the environment, has hardly changed at all." Chapter 2, pg. 31

"The critical myth is the assumption that we can 'clean up' our environment." Chapter 3, pg. 38

"I don't mean to imply that business acts without principles. But sooner or later we must recognize that despite the protestations of industry, it is completely lacking in ecological principles, and that what is good for business is almost always bad for nature." Chapter 4, pg. 57

"Under the 'products of service' concept, manufacturers would view both the materials and the methods of production in an entirely new way, since they would always have to imagine how they would reuse and reclaim the product upon its return. This calls for entirely novel principles of design that mimic what nature tells us: waste equals food." Chapter 4, pg. 68



"Free-market economists read the prices on the commodity exchanges and pronounce the patient well, ecologists read the deterioration of living system and warn of perils ahead. In order for any type of commercial ecology based on market principles to function, it will require that resources be available on a sustainable basis, that is using the resources to supply the needs of one generation in a manner that does not compromise the ability of future generation to fulfill those same needs. What does it matter is an industrial system is operating 'optimally' if the forests, soil, and water around it are deteriorating?" Chapter 5, pg. 80-81

"A number of climatologists assert that we cannot predict definitively the effect of a doubling of greenhouse gases will have. And that is true." Chapter 6, pg. 86

"The most damaging of the proposed GATT regulations is the principle that countries cannot 'discriminate between like products on the basis of the method of production.' Although innocent-sounding on its face, this provision essentially prohibits countries from using their own domestic environmental or social welfare regulations to prohibit or regulate products from other countries." Chapter 7, pg. 97-98

"But after a century of big-is-beautiful, we now find ourselves overshadowed by giants in our lives, from the federal budget deficit in the United States and global climatic changes, to sprawling corporations that don't know who we are, and, despite their protestations, don't or can't really believe in us." Chapter 6, pg. 101

"We know that public officials try to maintain 'deniability' when dealing with hot issues like Iran-Contra, but we are less aware that corporations allow a similar style of hands-off management that on the one hand encourages division heads and sales managers to be overly expedient or to cut corners, and on the other then allows the CEO to point the finger at individual several rungs below on the corporate ladder whenever trouble arises. The corporate 'rules' usually show that an isolated individual violated company policy and that the corporation as a whole should not be held accountable." Chapter 7, pg. 117

"The ultimate penalty a society can give a corporation is to demand that it cease to exist. In theory, this power still rests vestigially in the hands of the citizens according to the terms of every corporate charter." Chapter 7, pg. 121

"For a long time in American society, a large number of people thought they were advancing under the guidance and direction of commerce. As long as we could identify the improvements in the quality of our existence with the continuing growth and influence of big business, criticism of and dissatisfaction with the system were generally discounted or ignored." Chapter 7, pg. 126

"Literally thousands of native cultures around the world have been destroyed by economic development." Chapter 8, pg. 135

"Individual activity is empowering, but it cannot of itself change the nature of social and environmental degradation. The popularity of the notion that it's within the power of citizens to save the earth is not surprising, because it is in the very nature of modern

corporate capitalism, however inadvertently or purposefully, to put itself in the best light." Chapter 9, pg. 147

"In fact, all too often, the environmental movement has been the province of the upper-middle classes, both in concerns and in benefits, to the exclusion of lower-income and minority groups here and abroad who feel justifiably resentful that the gargantuan energy and resource appetites of industrially privileged few should now force them to make sacrifices in their own lifestyles and chances for a more prosperous existence." Chapter 10, pg. 161

"Because we perceive the environment to be only one of many 'important' issues, and because there is not a shared or universal perception of peril, our government is as yet unprepared to face up to the forces of environmental degradation." Chapter 12, pf. 202

Topics for Discussion

Why is business responsible for the environmental problems faced by the planet?

What does the term "death of birth" refer to?

What does Hawken mean when he says that businesses and the economy must become restorative?

What is the difference between growth industries and development industries? Why is energy conservation a growth development industry?

What are the problems caused by fossil fuels?

When a species becomes extinct, what are the problems that it causes in the ecosystem?

What are the three methods recommended by Hawken?