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The Corporation in the Community

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I. The Corporate Organism

Introduction

The metaphor for a corporation has been a simple mechanical model for turning resources into products. The accepted signs of corporate health were continuous growth and increasing profit. Unfortunately, the assumptions of the model were also simple and failed to consider human needs and natural cycles, causing great suffering and great disruption.

In the face of environmental instabilities, social decline, and shifting personal values, the model of corporate health needs to reflect stability, cooperation, justice, and respect for nature. To be successful ecologically, corporations need to embrace an ecological model as the basis for design, planning, management, and integration into natural and social communities. An ecological model forms the basis for understanding the characteristics of and reshaping the activity of corporations.

The Corporate Organism Defined

A corporation is defined by law as an individual person, although one that exists only in contemplation of the law—hence artificial, invisible, and intangible. A corporation has its own entirely separate and distinct existence; it is not its stockholders, officers, or buildings. This kind of artificial person was the invention of commercial interests; the first corporations were granted charters by special acts of English parliament to provide services for the state. Most corporations have characteristic legal features: • individuality, • permanence, • limited powers, • continuing succession, • power to act in the corporate name, • limited liability of members, • transferability of member's interests, and • representative management. Corporations are described by analogy with individuals, but each has unique characteristics: the corporation has right to property and free speech, but not right to worship or vote.

Charters have become easier to get, until now corporations can be formed under general law. Corporations have been adapted to meet most modern business and social needs. Although real persons can do anything not prohibited by law, corporate actions are derived wholly from law and limited to the charter, although charters have become very comprehensive statements that allow a great variety and multiplicity of activities.

In the publication "Integrating the Enterprise" by Digital Equipment Corporation, it is stated that "Digital is a living organism," tending toward a state of dynamic equilibrium by adapting to circumstances as fast and economically as possible. This is a natural-enough metaphor, and it leads to interesting deductions.

What is an organism? What are the unique characteristics of an organism, and how do they resemble the characteristics of a corporation? An organism is defined as a form of life that is composed of parts to maintain its vital processes; its properties are determined by the relations of the parts and the character of the whole. Every organism shares certain characteristics: • It has a single genetic stock (genetic integrity); • It has a physically discrete form and size that it maintains by processing energy and materials (physiological integrity); • It is an autonomous whole, perceiving and responding as intelligently as possible to other forms, creating a self-world with very distinct limits (in place); and • It is born, ages, reproduces its form, and dies; it acts to preserve itself and duplicate itself (maturity and reproduction).

Corporations share these characteristics. Genetic information is coded chemically, but cultural information, which shapes corporations, is coded and stored outside the body in a "meme" (Richard Dawkin's word for a replicating unit of cultural information). Memes tend to survive if they enhance the fitness of organisms who use them; they can be destructive when misused—for instance, advertisements for weapons or wasteful products. Every corporation is formed by human beings; development is channeled by legal paperwork.

Corporations maintain their form by processing energy and materials. Like an organism, the corporation, unconsciously through its officers and managers, starts to act to preserve itself before completing its formative objectives, such as maximizing profit. The size of an organism is related to its metabolism; too large and it could not maintain its metabolism or regulate its temperature. Organisms are limited by too

little of an element in a place or too much. Limitations are necessary for shaping and preserving an organism. Corporations may also have an optimal size, beyond which they collapse; organisms that grow too large are considered monsters. Corporations became larger as transportation costs decreased, allowing the economics of scale offered by industrial processes. Large corporations attracted large capital to build larger plants. Many of them exceed the limits of place by going outside of the place for labor, resources, and markets. Now that every place is being developed or preserved, too large a size is not sustainable.

Every organism creates an image of its place from what is meaningful to it. This image is what fits the organism to its unique world (from the German word for man-image). The organism actively adapts to changing conditions, which implies that it has a memory and is capable of learning. What it does in place is referred to as its niche. Adaptation to changing conditions is never perfect; over specialization reduces flexibility and ability to change, while under specialization reduces efficiency. Furthermore, the organism is goal-seeking, even if its goal is simply to live well and improve its situation. This improvement implies that the organism is attuned, flexible, receptive, and integrated to its environment. Corporations also perceive and create a world based on perceptions, which depend on size and sensory apparatus. Large corporations tend to see larger systems. Thus, they have not had to adapt to or fit a place—and do not seem to have developed the behavior to do so.

Most organisms are inseparably related to the places where they live (habitat); most organisms identify with place, strongly enough in cases to mean life or death. Like organisms, corporations have a home place. Organisms that are out of place are considered exotic invaders; they not only exploit another's niche, but they interfere with the relationships of other organisms. Like an organism, a corporation lives in place and alters that place to some extent by living, although some of the larger ones risk destroying the mixed community of humans, animals, and plants (and all their associations) on which they depend. Corporations do not seem to be sensitive to the kind of feedback that could fit them in a place.

Like an organism, each corporation is born, grows to a certain size, then matures and dies—perhaps a natural span is hundreds of years, like the Oxford University Press, or perhaps only a year like so many new businesses. Biological maturity marks the end of physical growth in organisms, but not necessarily the end of emotional, intellectual, and social development. Corporations do not seem to mature in this sense; development seems to be always accompanied by growth, although this is not a necessary relationship.

Problems with Corporate Organisms

The old analogy of the corporation as a machine leads to destructive assumptions: • that everything is a resource; • that resources are unlimited; • that production must continue endlessly; • that the corporation has to keep growing to survive; • that the purpose of the state was to legitimize exploitation; • that the purpose of humanity was to multiply, produce, and consume; and • that the purpose of the universe was to supply human and corporate needs. The machine analogy also leads to false economic beliefs: • that mass production is most efficient; • that obsolescence is necessary for successful growth; • that people's needs and wants are fulfilled by advertised products; and, • that quality does not matter very much.

Many corporations are suffering problems as the result of inappropriate assumptions and false beliefs. These problems include: • overgrowth, with an increase in complexity and costs (many of them social); • economic and ecological instability; • social burdens (from pressures on the family from relocation and powerlessness); • misdirected effort on ill-conceived products; and • slack employee attitudes and performances (resulting in sickness, accidents, turnover, and layoffs).

In the effort to avoid or manipulate their problems, corporations have sought more control over their environment. This is similar to what rodents do when they bury seeds. The corporation tries to avoid being vulnerable to change and uncertainty, fluctuation, and market conditions by relying on planning and control. Corporations try to ensure stability of their immediate environment by taking over the supplies of materials, controlling their subcontractors and the buyers of their products, controlling the work force with pay and incentives (as well as by cultivating identification), and managing demand by sales influence and advertising. Many corporations try to be flexible about resources, using what costs the least, for example, cheap energy to replace expensive labor. Corporations, especially multinational ones, seek raw materials everywhere, in any nation or under any ocean. Corporations become international, mining, assembling, and selling in different continents. Where developing countries were once regarded as sources of raw materials, they are now used as bases for manufacturing, and they are becoming growing markets.

This control is possible because corporations have acquired such great power. Large multinational corporations have great power to control national economies and ignore environmental laws, partly because of their historical promise of providing social services to national states and partly because of the weakness of other institutions. As private good

became identified with public good, corporations became less concerned with social service and more concerned with greater profit through greater technology. Greater technology permits the power to change things to overwhelm the power to see the consequences of changes. Thus, necessities such as clean air and fresh water, are violated legally—after all, no right of contract or fair use of property has been breached.

Furthermore, the size of some companies means that their influence sends shock waves through societies and environments. Multinational corporations dominate the business world, influence world affairs, and overwhelm other living organisms. Size and complexity give them special power, not only financial but political. Power is expected to evaporate in a purely competitive economy, but capitalist economies are not purely competitive; thus, power accrues to corporations. The use of power allows many corporations to escape the social consequences of their actions, through lobbying, noncompliance, and blackmail, as well as to pass on the environmental consequences to others to poor or powerless to refuse them. Corporations keep increasing their power because of a fear of losing control. This constant quest for power is infantile, according to Freud. It leads to over polarized world views (us vs. them or good vs. bad). He predicted, however, that such behavior would diminish with maturity.

Usually the goals of a company are generously, nobly, and broadly stated as intentions to support the best interests of the owners, managers, shareholders, partners, the public, and, lately, the earth. Many corporations pride themselves on their generosity and personnel standards and on their good corporate citizenship, although many corporations that claim to make clean products in safe ways seem to depend on "dirty corporations" for power and packaging, as well as for paper and materials. The public concept of good is being extended beyond traditional bounds as citizens become aware of the interactions of business, politics, and the environment, and corporations may not be able to avoid improving.

Like robins to fermenting berries, any organism can become addicted to certain things under certain circumstances. Corporations have become addicted to cheap energy and easy defense money. It is possible to create circumstances that limit or cure the addictions; for robins, the berries are seasonal and fall to the ground. For corporations, the cure is a switch to full-cost accounting, which shows the real cost of energy, and to a responsible economy, which would eliminate huge military build-ups.

Business as usual, with its inertial model of growth, could end in catastrophe for humanity and its environments. Corporate cultures, with their characteristics of simplification, naiveté, homogeneity, and incompleteness, turn wild landscapes into flatscapes, where variety disappears and significance is ignored for the comfortable standards of meaningless continuity. Rapid growth might precipitate a catastrophe sooner, while modest efforts at environmental protection and increased efficiency may only postpone a catastrophe.

An ecological model offers an alternative to catastrophe, with its emphasis on energy efficiency and alternative sources, its major commitment to environmental protection and the internalization of environmental costs, and its emphasis on stable, sustained development instead of growth. Such a model would provide more adaptive assumptions and beliefs: • that resources are limited, • that human value is only part of ecosystem values, • that humans are more than consumers and producers, and • that the quality of life is more important than quantity of possessions.

Healthy organisms are educated to take their place in a culture that limits their impact on the environment, proscribes their actions towards one another and towards others outside the culture, and trains them to reproduce themselves and to renew the culture as well. Most corporations act like improperly socialized individuals who have not been taught how to make a proper place in society or how to be responsible for their actions; instead, corporations hide behind their legally limited liability.

Organisms in Context

Organisms have been defined minimally as a set of parts responding to external stimuli. But, organisms can only exist in a particular place as part of a population; and, populations of different species in a habitat assemble into a community; and, a community in its environment comprises an ecosystem (which make up the biosphere). Organisms take a large part of their identity from their context, from the surrounding environment. The organism is a whole, an interface between its parts and its context. The context of an organism is an ecosystem. Ecosystems occur in a large diversity of sizes in nature, from a rotting log to a watershed.

An ecosystem is defined by Eugene Odum as a biotic community and its nonliving environment functioning together. An ecosystem is also a self-organizing, chaotic system with emergent properties and unique characteristics that develop in time. That is, a community develops by a reasonably orderly, directional process that involves changes in structure. Although the physical environment imposes limits and determines a pattern and a rate of change, the community controls the succession and modifies physical environment. The result is a relatively stable

configuration characterized by a high biomass (or information content). The "strategy" of ecosystem development is increased control of (homeostasis or homeorhesis with) the physical environment—to protect itself from perturbations.

• There is a fundamental shift in energy flows, as increasing amounts of energy are used for maintenance. As more and more energy is used for maintenance, the net community production approaches zero. The mature system becomes more efficient, as it supports a larger biomass with the same amount of energy. The food chains become more weblike (dominated by detritus chains as opposed to linear grazing).

• The structure of a community changes, also: organic matter increases, inorganic nutrients are used internally (instead of being extrabiotic), biochemical and species diversities—information content—become high (the numerical abundance of one species, such as humans, is not the same as diversity); and pattern diversity becomes well-organized. Mineral cycles become closed, and the nutrient exchange rate between organisms and the extra systemic environment slows.

• The life history of organisms undergoes change as well. Organisms tend to be larger (perhaps as a result of shift from inorganic to organic nutrients), with longer, more complex life cycles and narrower niche specialization. Organisms get larger because all of the small and intermediate sizes are represented all the time; the only place for expansion is the upper end of the size scale—elephants, for example, avoid competition by finding a new niche above others. Population growth slows, with emphasis on the quality of life of organisms. Internal symbiosis becomes more developed, conserving nutrients and resisting perturbations. Cooperation becomes an effective strategy for survival. Most organisms avoid direct competition; they expand or create a niche instead. Cooperation creates communities in which competition is necessary but limited. The relationships between organisms become as primary and real as the organisms themselves. The organism appears as a knot in the field of relationships.

If civilization or culture (the environment for corporations) follows a similar pattern over time as ecosystems, we would expect similar developments in corporations. Corporations have been evolving for hundreds of years. There have already been shifts in the meaning of corporations and in the forms of organization and style:

When corporations mature, their "food chains" should become more complex, with most of the energy flow following detritus pathways. Organisms evolve that live on the waste products of other organisms; this is not as often true for corporations, where waste is just disposed of in natural (clogged) sinks. The current industrial pattern greatly increases the flow of some materials, such as sulfur or mercury. Mature corporations could optimize material and energy use, reusing wastes as resources—wastes are products, not side effects. Corporate structure may change from a single pyramid of organization to constellations of satellite concerns, from product line management to networks and innovations.

Corporations are evolving from a product based definition, e.g., shoes, to a process based one, e.g., information, Mature systems have a greater ability to trap nutrients for cycling. Corporations have settled in an artificially maintained pioneer state, feeding on the extra productivity of the developing ecosystem. Industrial agriculture, for instance, keeps an ecosystem immature in order to harvest the larger yield. Forestry likewise destroys mature forests and replaces them with immature woodlots because successional trees grow faster. Corporations sometimes parallel the aging of an ecosystem, from a pioneer state to a mature state. Corporations are moving towards closed loop recycling, starting with compliance and then partial recycling. They are also gradually making changes in products and packaging, although ecological design would make recycling redundant.

Corporations are moving from the static to the flexible, from a stable product line to continuing process. A mature ecosystem produces many things, most all of which are used by the system; wastes are broken down into component chemicals by microbes, while other resources, like nitrogen, are fixed to roots by other microbes. The tightening of the biogeochemical cycles is an important trend. This means new corporations (diversity) may form to consume the wastes of others. Reciprocal adaptations between plants and animals, or between producers and consumers, leads to mechanisms that increase feedback and reduce one-way processing. Partnership between unrelated species, mycorrhizae and trees for example, becomes notable. Corporations would team up with other companies and social and environmental groups (in a pattern of industrial symbiosis—most automobile companies rely on hundreds of suppliers).

Unlike ecosystems, corporations still seem to be bound inflexibly by the rule of two-year payback. This means that decisions are based on short-term return and not on long-term durability. Yet, the longer lived the corporation, the less clear the divisions between private and public and economic and environmental concerns. Short-term individual concerns meld into long-range corporate and social concerns. The short-term pressures may seem immediate and irresistible, but the long-term goals cannot be ignored for long. We may need electric power or paper now, but the cost cannot be the destruction of the source of those needs. We need the social and environmental health

and stability first and always. Although ecosystems can be long-lived—thousands of years for tropical rainforests—corporations can disband at any time. Furthermore, although large organisms are typical of mature ecosystems, the scale of many corporations is too large; the patterns are unsustainable—large institutions lose touch with their constituents, become self-absorbed and less responsible. Although a few large corporations are actually so powerful that they eliminate market forces, most corporations are small or intermediate in size. As capital dries up, large size becomes less profitable and less suited for future community constraints. Smaller corporations can undersell larger ones.

The activities of corporations can be brought into alignment with natural processes. Corporate structures can be designed as domestic ecosystems self-consciously integrated with wild ecosystems. Corporations need not be passive reactors to environmental limits and conditions. They could create new niches and thus expand ecosystems. Although corporations could eventually adhere to the parameters of the surrounding ecosystems, they could also condition the parameters through feedback to their advantage.

Placing corporations in their larger context suggests conscious and directional changes to corporations. Human communities can provide cooperation, security, order, and rootedness for corporations and their associates. They can redefine corporations and limit their impacts. They can change the charter of corporations for the benefit of the community. They can require a legal presence and responsibility. Since communities could charge for their previously free natural services, such as water and clean air, an income tax on corporate income would not be necessary (John Cobb, Herman Daly, and others suggest this). The community could also require that profits go to stockholders, including the community itself, which provides the social infrastructure for the corporation. Communities could also apply pollution and severance taxes (for depletion quotas).

The corporation, regardless of its legal definition, is a long-lived, collective, impersonal body. Its investment is long-term in actuality. Many stockholders keep their investments for decades or a life-time. They are not concerned about only one dividend. Like the corporate organism, they want the long-term outlook to be positive; they want to know that their investment is stable and that the quality of life it encourages or supports is continuous. Corporate survival is one of many units of human survival. A corporation can live for decades or centuries, much longer than human individuals but about the same as a family or nation. Corporations must accommodate the conflicts in loyalties between the individual scale and the survival of cultures and the human species.

A voluntary product and process design could be more wealth-producing in the long-run, avoiding the constant compliance to increasingly strict regulations, and anticipating zero public tolerance for some pollution and shoddy products. Some companies have started to work around these beliefs.

Corporations have already learned the value of "green" advertising and are intensely practicing green lip-service as a road to profitability. Many of them are putting small changes into effect, while continuing business as usual. Other corporations are gradually evolving into smaller, locally based and responsive citizens.

The total relations of an organism with its environment is the study of ecology. The ecology of corporations can help us understand how to make them fit into the whole system without disrupting and destroying it. An ecological metaphor can provide a conceptual framework for an ecological corporate existence, one that acknowledges its dependence on other species and on the web of relationships for its existence.

II. The Ecological Responsibilities of Corporations

The public responsibilities of corporations, according to Harvard management, are to grow and prosper—thereby providing customer satisfaction, employment, taxes, and contributions to the economy—and to control their hazards. According to Milton Friedman, the only social responsibility of a corporation is to make money, by striving after profit as an efficient agent of production, although he admits that the corporation should conform to the rules and norms of society.

Corporate responsibility is more complex than a simple, linear cost/benefit analysis. Using the metaphor of corporation as organism, it is possible to outline a new set of responsibilities for corporations and a series of behaviors that human individuals and communities can practice to integrate corporate behavior into the communities. With an ecological model, the ecological responsibilities of corporations, to themselves, to nature, and to human communities, are described.

Profit making is a necessary part of business, but not the sole reason for business. The best business serves public goods as well as private interests. This is analogous to Ruth Benedict's original anthropological meaning of synergy as applied to individuals. In secure, nonaggressive societies, an individual serves her own advantage as well as that of the group with the same act. The institution ensures mutual advantage; the acts are mutually reinforcing. High synergy institutions transcend the polarities of selfishness and altruism. Virtue pays because the rewards for selfishness coincide with benefit for the society. The social structure of low synergy cultures ensures opposition and counteraction; the advantage of one individual is a victory over another, as in a zero-sum game. Synergy is necessary for corporate partners, since they have to feel like their work is meaningful and contributing to the public good. The path of production should therefore serve public good as well as profit. Environmental and social problems should get as much attention, because they are as much a part of the process as sales, finance, and production.

Economic recession may bring a re-examination of values, not only by individuals who have less material wealth, but by corporations that have emphasized growth. The public may insist that corporations consider social performance as well as strictly economic performance. The single economic purpose may only be the focus in a social environment. Economic actions, such as where to build, who to relocate, hire, or dismiss, may be subjected to greater public scrutiny. Corporations may have to adapt to changes in standards. Business cannot assert a primary self-interest at a cost to the public or environment. Corporations need to keep track of their environmental impacts. Many of the problems that corporations face are connected to the problems of the environment and society.

Every corporation depends on the stability of the environment and on the stability of social institutions. The environment provides air, water, land, and renewal (both physical and psychological). Institutions, from sanitation, police, schools, churches, and community centers, provide a supporting network. As these institutions wobble or fail, corporations may have to subsidize or replace them to survive. Schooling for example, is often inadequate to provide literate, numerate, or ecolate (Garrett Hardin's term) workers. Police may not be able to provide secure conditions on corporate grounds for female workers. Public transportation to plant sites from town may not be available in enough volume.

A corporation has traditionally been seen as a morally neutral body, but even if it has only to conform to the nominal rules of society, it is already a moral agent. Corporations are no more neutral than other organisms. Etymologically, the word moral means simply "living together." Sometimes even routine business matters become deeper ethical conundrums about justice. Many areas of moral concern already are recognized: worker safety, affirmative action, advertising truth, foreign investments, and harm to the consumer, public, and environment. More areas are becoming evident.

Corporate responsibility occurs wherever the interests or rights of a person, society, or ecosystem are significantly affected by the actions of the corporation. Responsibility can be understood in terms of costs and benefits, that is, through operations and their consequences rather than abstract behavior. Every action entails a gain and a cost (or profit and loss). Profits and losses are distributed privately, socially, or environmentally. The current system privatizes the gain and externalizes the loss (to the "commons," considered as a pool of "unowned resources," whereas, in traditional societies, the commons was governed by rules for use). As long as this distribution is possible, it is profitable to charge the cost to the environment. Externalizing costs works fine in an uncrowded world, where the costs are negligible and can be absorbed by natural processes. Resources were traditionally seen as free for the getting; air and water were seen as free sinks for wastes. Modern economies, embracing the notion that "nature is capital," draw on the accumulated "capital" of ecosystems for production. By ignoring the real cost of the capital, as well as the costs of natural services, such as nutrient recycling, soil building, and atmospheric renewal, these economies create a temporary wealth. Decisions regarding resources are made on

short-term economic grounds and lead to material shortages and environmental degradation.

Similarly, labor was seen as minimum value. For example, the idea that "labor is a resource" implies that, like any common resource defined by industrial society, labor is cheap and can be used up. The real costs of free goods and externalities have not had to be accounted for, yet—this often influences the selection of corporate priorities and growth, not to mention successive relocation to areas of less expensive labor.

Furthermore, the production and distribution system for most corporations is linear (straight throughput) and not circular (complete recycling), although this is logical for a short-term economics shaped by frontier resource-use accounting. Major changes are occurring, though. The scale of civilization now makes externalization unfeasible. The costs of pollution and waste are being internalized; other inputs, such as labor and capital, are becoming more expensive. Corporations will have to internalize or be forced to internalize. With the internalization of costs (since the losses as well as benefits accrue privately), the corporations would benefit from intrinsic responsibility.

Corporations need to work cooperatively to make sure the costs and benefits are extended equally throughout the system. They could start by sponsoring the rational use of rare resources through taxation, and by influencing the government to determine priorities for wilderness areas or special landscapes—beautiful, fragile, unique, or endangered ecosystems and species must be protected at the expense of commercial activity.

Corporations have at least three large, ecological responsibilities. These are: to be economically healthy, to ensure the health or their natural communities, and to ensure the health of their human communities.

1. To be Economically Healthy

The first responsibility of a corporation is the maintain its own health, to mature organically, limiting its size and impact to its home locality. Corporations could:

• Create a department with ecological authority to envision long-range plans and impacts. Corporations need to react more quickly to monitor their ecological and social environments for the emerging patterns that determine their future. They need to anticipate and participate in the social and natural framework. A new department, with global, anticipatory functions could provide direction and continuity. Such a department could be justified in the same manner as military forces. Military expenditure is a nonproductive cost; its benefits are general and long-range—that is, it must discourage war in the next decade as well as in this one. Its scope of advice would include educational services as well as advertising, capital acquisitions as well as new products, and plant engineering as well as security.

• Plan all foreseeable consequences of a product. Advanced technology permits the power to change to overwhelm the ability to foresee the consequences of change. Avoiding the opposite actions of intentions (recognized by the Greeks as the operation of tragedy) is extremely difficult. Good intentions are not enough: Labor-saving devices may contribute to unemployment and social problems; foreign aid may result in starvation for more millions as local agriculture cannot compete; and the environmental management of some species for sustainable yield causes the population to collapse.

• Determine an optimum corporate size and maintain it. After a point, growth results in inefficiency and nonadaptibility. Development, on the other hand, can continue for hundreds or thousands of years. A smaller size could mean more flexibility and faster response to local conditions. Recognize material limits. The global economy is probably too large already to be supported by the natural systems of the planet. Find an upper limit to the economy of scale. Accept limits to growth based on materials and on nonrenewable or dangerous sources of energy. This should not limit development based on advancing technology and knowledge.

• Adjust corporate strategies to changing values. Smaller social and cultural groups have different and diverging values, so corporations are going to have to adjust to a diversity of values instead of to a monolithic standard. The structure of power is disintegrating, with information replacing things as wealth. The knowledge-driven economy is more decentralized and customized. This moves us towards customization of production and away from mass production. Change the shape of the corporation to a framework coordinating separate divisions sharing information. Each division could react much more quickly to market conditions.

• Work to delineate a new information model of production in which the stages of a process (capital, materials, workers, design, advertising, selling) are simultaneous and synthesized. The conception of the product is extended from design (even customer contributions and design of working conditions) to aftercare, including ecologically safe retirement and disposal. The notions of efficiency and productivity are changing. Innovation and computer technology shortens product life cycles. Production diversity is increasing. Convert the information model to an understanding model. Information is just data without appropriate structure. Provide a structure and material base for understanding through communication, education, and training.

• Enter partnerships with the employees. They are already partners in fact. Refer to them as partners instead of employees. Address the optimum productivity of employees. For instance, government studies show that half-time employees are more efficient than full-time ones. Adjust the work force so that people could work fewer, more flexible hours, thus avoiding layoffs. Increase worker participation. What is extent of worker participation in management of workplace? New forms of ownership could mobilize workers in a more efficient and democratic economy. Provide ownership incentives. Productivity is declining, so is job satisfaction. Efficiency and productivity are often less important than use and appropriateness. Better pay and shorter work weeks do not compensate for lack of worker control. Offer more control. Streamline the organizational structure. Organizing workers in a bureaucratic hierarchy is costly. The best path for organization is lateral modularity. The levels and costs of management could be reduced drastically.

Encourage cross-reviews of managers and producers. Eliminate status items, such as management washrooms or junkets. Encourage personal growth. Make sure that the partners align their self-interest with the corporation and community.

• Promote the principle of least effort, allowing the company to consume less, recycle, use longer, and avoid waste. Corporations could develop renewable energy sources. Conduct a complete series of audits, including an energy audit for every building. Reduce office costs through energy conservation planning. Use renewable energy sources. Energy and materials can be used and reused, flowing through the system. Ship by the best overall transportation, such as rail. Cars are ecologically unacceptable forms of transport, yet companies intrinsically recognize them with large, free parking lots. Discourage commuting; encourage telecommuting or even alternate forms of transportation (bicycling, buses, and trains). Minimize wastes, for instance, by using permanent packaging (milk bottles and cola bottles can be reused forty or more times). Conduct a complete series of audits, including an environmental audit to determine negative impacts, from acid wastes or product disposal, and a problem audit, to include inherited problems. Produce a comprehensive annual impact statement.

2. To Ensure the Health of Natural Communities

The second responsibility is to maintain the health of natural communities—because environmental health is the basis for community health, and community health is the basis for economic health and worker health. The quality of life depends on the quality of the environment. If the environment is degraded to raise the quality of life, the effect is very limited and can never be self-sustaining. Fitting economic costs and needs to the limits of ecosystems and monitoring the economic process would reduce wastes and pressures on natural processes. The coupling of agricultural productivity to a solar budget, and the conscious restoration of degraded systems, would contribute to the health of ecosystems. Sufficient wilderness would allow the self-maintenance of global cycles. With the increase in security, wealth, and self-esteem, human populations could be dependent on ecosystem productivities and still be diverse and unique. What made us human was that, in addition to human social groups, we lived in communities with other species. We learned spontaneously from other animals and enjoyed their company. We are poor and malcontent without them.

• Be accountable for ecological impacts. Corporations should be held more accountable for their technological impact. New technology will be more closely regulated. Corporations could anticipate this by favoring open appraisal of new technologies. By studying the potential consequences, physical, social, and ecological, as far as possible into the future, of its innovations in information technology, a corporation can gain credibility. Otherwise, it can wait and be forced by public and governmental pressure. Integrate loops and material flows; internalize cycles.

• Avoid interference with natural processes. Technological processes must be brought into balance with the cycles of the earth. They must not damage or degrade natural cycles. Avoid unnecessary harm. It may be appropriate to use trees or to compete with black bears for tree use, but it is never wise to destroy the ecosystem of trees and bears. Laws on pollution and noxious wastes have been notoriously lax and sometimes wrong-headed. Minimal acceptable tolerances are legal, yet people often prefer zero amounts of many substances. Minimal compliance with them is virtuous for many companies, but it would be better to lead to higher standards. Work toward setting zero-level goals. Do not dump exotic or dangerous wastes. Do not discharge quantities of "safe" wastes.

• Integrate buildings into plant sites. Corporations maintain building and plants in thousands of locations, each requiring support. Convert to ecological grounds practices. Forgo economic development of key ecosystems, which should not available for human use. Consider adjusting the economic pace to natural rates; do not cut trees, for instance, faster than they grow. Consider minimizing use of ecosystem productivity to the net ecosystem productivity, rather than the gross productivity, especially as regards fisheries.

• Promote ecological design, which starts with questions. Is the product low-cost, aesthetically pleasing, and ecologically wise? Where does it fit in

society? Ecological design, both responsible and socially responsible, must be radical, that is, rooted in a community in place. Membership in a place, in fact, leads to community. Corporations must become responsible members of the community. It would encourage an ecological approach to systems and processes in the whole environment, where the product, with its plant, engineers, and advertisers, is a link in a long biomorphic chain stretching from knives to surgical microchip memory implants. Ecological design has important characteristics for responsible technology: The products are designed by interdisciplinary teams considering all parameters and consequences; ecological sciences offer creative insights into design through a search for underlying organic principles; the product must be related to the particular environment, the tool is a link between human and environment.

3. To Contribute to the Health of Human Communities

It is hard to protect communities when the way most business is done tends to disrupt community life. Because of its size, power, and intention (often just for profit), the corporation should take higher risks—not lower—than the surrounding communities. This will ensure the safety of products and wastes.

• Support the community. The work place is not just collection of individuals. It is a number of groups. Group interaction can change attitudes. A working community can build mutual responsibility. Show proper behavior; learn community etiquette.

• Design the corporate structure and size for the community. Limit unnecessary movement or disruption. Plan the shape, size, and products of the corporation to fit the local community. Encourage self-reliance in communities. Communities can be self-reliant: Δ by producing enough food and shelter, Δ by limiting their population to what can be produced, Δ by using local products and raw materials (soil, minerals, plants), Δ by using general and not specialized machines, Δ by having multipurpose factories, Δ by networking with other communities, and Δ by doing without things that are not needed, e.g., bombs, food additives, or plastic bottles.

• Behave ethically. An ecological corporation could use corporate buying power to promote acceptable technologies and discourage unacceptable practices. Deal less with nuclear weapons contractors and more with solar energy companies. Deal less with one-shot paper companies and more with recycling paper companies. Boycott paper companies involved in Rainforest destruction or old-growth forest destruction. Avoid banks that invest in anything that brings a high return, from third-world debt to Amazonian destruction and South African discrimination. Favor peace-oriented companies as business partners. And, refuse to participate in work that is socially destructive.

• Participate in the economic and social functioning of the community. Economic development and social progress are necessary for the welfare of humanity, but must be conducted with environmental knowledge. The goal of economics and politics is to provide suitable and comfortable human habitations and meaningful activities. Human settlements must be planned and constructed within environmental constraints and according to ecological priorities. Work to preserve the structure of the natural and social communities. Corporations can encourage decentralization and restore schools, clinics, and shops to local communities. Offer cooperative control with the community. Change the pattern of ownership to reflect employee and community participation.

• Promote ecological education. Encourage cultural traditions; refuse to let social and spiritual needs be subverted by economic ends. Help lead the young into their adult responsibilities through training and participation, perhaps with apprenticeship programs. Educate people in appropriate ways to achieve wealth and well-being. Teach appreciation of the services rendered by nature through flows and cycling. Point out the unexpectedness of the consequences of even simple corporate interventions and innovations, e.g., positive feedback, biological concentration of poisons, and synergetic effects of simple new chemicals like CFCs. Trace the complex and reciprocal relations of soil, climate, vegetation, and human activity. Emphasize that a fixed set of ecological parameters in an ecosystem can not be maintained in a sustainable way, because the system is dynamic and changing. Put computers in proper perspective. Children do not need computers to develop the powers of thought, but they do need an ecological curriculum where animals display greater powers of mind than computers or machines. The important technological advantages of a computer, word-processing, database searches, complex connections, and rapid computation, are not really needed before high school, unlike myths, languages, and physical activities.

• Implement community responsibility. Encourage people to take responsibility for all of their actions, from reproduction to consumption and politics. The responsibility for the welfare of the citizens belongs in the community, as does education, safety, and the whole infrastructure. Corporate management is responsible for developing programs to set goals, modify structures, and introduce criteria to measure progress. The Board of Directors are responsible, as the architects of responsibility and stewards of the human and material resources; the

government is responsible, in its legislative, judicial, and regulatory functions.

Summary
The complexity of environmental problems should not permit corporations to escape their responsibility. The context of corporate responsibility falls within the spectrum from individual responsibility to social responsibility (the designation of property or trading conventions). Perhaps that responsibility could be enforced if the entire earth were incorporated and concerned with maximizing its own values: healthy beings in living contexts. Certainly not having 'free' services and resources would force corporations to internalize all costs of production.

There are strategies that a corporation could pursue to become ecologically sound. Instead of treating decisions as trade-offs, an ecological corporation could aim at a congruence of moral, economic, and ecological objectives. Responsibility could be manifested in organizational structure, manufacturing, and marketing practices, without departing from economic decision making.

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