"...A Balance Of Head, Heart, And Hand": The Philosophy Of Decentralization In The Works Of Ivan Illich, E. F. Schumacher, and John Todd

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"...A BALANCE OF HEAD, HEART, AND HAND"

THE PHILOSOPHY OF DECENTRALIZATION
IN THE WORKS OF
IVAN ILLICH, E.F. SCHUMACHER, AND JOHN TODD

by

NICKI (MONICA) VERPLOEGEN

A Thesis submitted to the Department of Political Science of CARROLL COLLEGE in partial fulfillment of the requirements for academic honors with a Bachelor of Arts degree in Political Science.

Helena, Montana
March 31, 1978
This thesis for honors recognition has been approved for the Department of Political Science.

Director

Reader

Reader

March 20, 1978
To Paul and Alice (Dad and Mom)

Clear dewdrops of wisdom
Rest quiet on our love;
Dirt of our hands,
blood in our veins.
Together we labor
the land to its birth.
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CHAPTER I

REASONS AND RESULTS

Tangled webs and shattered mind,
Yearning for the depth behind,
Fear the very end pursued.

Massive metal gears the brain,
Chanting loud a deaf refrain.
Speed, the very end imbued,

Rubs against a festered sore;
Bleeding mind which begs for "MORE"
Finds the satisfaction gone.

Heart, unstirred and cloistered off,
Shielding self from smile and scoff,
Sees dissatisfaction drawn.

Repeat, repeat, repeat . . . .

For four thousand years of recorded history, society has believed that unlimited technological development was the route to progress. Advancement along these lines has always been highly valued. Present reality dictates that we reevaluate this belief in unlimited expansion. Why is it that only now the general populace has reassessed its attitude towards unrestrained growth? What has prompted this examination of perhaps the prime societal value?

During the last two decades, the possibility of exhausting the resources that fueled this growth has become visibly apparent. What poets and prophets have proclaimed for centuries is beginning to be commonly accepted: the present reality finds the theory of
unlimited technological growth detrimental to the relationship between the environment, the society, and the individual person. Our world now operates on such a grand scale that its total health including that of its individual inhabitants is endangered. Limits need to be established, limits that reflect our concern for the damage done to these relationships.

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The environment in the broadest sense creates man.
At the same time man reciprocally creates his environment.
Thus in a civilization powered by energy that has been extracted from matter, man becomes increasingly off-center and materialistic.  

Robert Hargrove

The neglect of the relationship with the environment appears most acutely in our persistent search for fossil fuels. Fossil fuels, found toward the center of the earth, are composed of the remains of creatures that lost their vital forces thousands of years ago. Literally then, human existence is maintained by remnant of energies of the past. Generations have survived on these sources, believing that not only was it their perogative but also their right to use the earth's resources for their own benefit.

This attitude stemmed from an interpretation of the Biblical story of Adam and Eve. In Genesis, when God created Adam and Eve, He put them in charge of the world He had created by saying:

Be fruitful, multiply, fill the earth, and conquer it.
Be masters of the fish of the sea, the birds of the heaven, and the living animals on the earth.

The interpretation of this passage with the words "conquer it" and "masters" led humanity to the view that its relationship
with the environment was one of domination. The earth, definitely separate from humankind, was regarded as an object to be controlled and molded to suit human needs. This Biblical reference gave humankind the license to "use" the earth's resources for its own gain. That "use" included any demand that benefitted humans without consideration for its resultant effect on total reality. What is now termed "exploitation" was considered acceptable then.

This attitude was further complicated by the Calvinist theory of creation. Calvinism saw creativity as evil with tendencies towards good. Included in this thinking pattern was the belief that if creation was so abhorrent already, then, further damage was not possible. Something that is so totally corrupt could not be corrupted further. Therefore, any action against the universe could not be seen as a negative gesture. As David Crownfield writes,

> The Calvinist is always busy doing, never sensually or tranquilly enjoying. His relation to the earth is to dominate, exploit, and extract, rather than to co-exist in the closed circle of our common life.\(^3\)

This attitude is still evident today in many of society's transactions with the earth. Without the awareness of a relationship existing between humanity and the environment, it would be easy to detach oneself from the natural sphere. This detachment is the root of modern consciousness concerning the environment. An attitude based on these principles justifies open pit mining, oceanic petroleum drilling, and hydroelectric damming, while legitimating the slaughter to extinction of fur-bearing animals. The earth is regarded as man's playground, an object for his sustenance
and recreation. There is nothing offensive about pollution, over-population, soil deterioration, or the nuclear manipulation of molecules. All fit into this order.

However, a healthier interpretation of Genesis would declare humanity the caretaker of the environment. Stewardship of the land implies not its abuse but a responsible protection of the earth. As human beings, we are commissioned to care for the biosphere from which we derive our livelihood. Whereas the previous interpretation denies the relationship between humanity and the universe, this viewpoint acknowledges and nurtures it. It would be difficult to denounce our dependence on the ecosystem and its influence on us.

As Tom Bender writes,

We have ignored our own active existence as an important part of our environment giving form and meaning to our surroundings. We have focused on changes outside us which could be "bought"—with little commitment, understanding, or growth on our part...We have drawn a distinction at our skins which is contrary to the most important relationships and processes that concern us and our well-being. WE ARE OUR ENVIRONMENT—the environment of our minds brings into existence both the conceptual and physical space we inhabit, what we are becomes our world.

The Western culture predominantly saturates and devours the land until it is infertile and then moves on, believing there is always more. More is running out. The technological devices used to obtain more efficiency, more speed, and more energy are consuming the dwindling energy and causing an "energy sink," meaning they consume more than they produce. Yet, we continue to build energy-intensive machinery which damages the environment in an effort to satisfy the push for "more." Environmental limits are willfully ignored.
The impact of industrial levels of energy on any social environment tends to be just as inevitably destructive as the impact on the physical milieu.  

Ivan Illich

High levels of industrial growth not only demean our relationship with the environment but also affect social relationships. If society exceeds a certain per capita energy level, the political system and cultural context of society decays. Abstractions are no longer valued since they do little to improve the industrial mode. Technocracy prevails. Industrially-minded planners take over with their knowledge and their insatiable drive for "more" without concern for other facets of society.

There was a time before industrial efficiency when limitations were recognized by the scientific world. Previously, scientists realized the reality of nonsatisfaction—their own limitations. Progress had not overtaken development and there was a belief that some things were not made by man and could never be wished away. In time, the belief switched. Reality itself became determined by human decision. Humanity began to believe itself capable of creating and destroying at will. The machine became its tool. Industry dictated work, education, and living standards. As Ivan Illich, author of Energy and Equity, states:

Industry shapes a new kind of man to fit the new geography and the new schedules of its making.

Society grew continually more systematized, institutionalized, and constantly more conditioned. It increasingly catered to the productive system, adopting its values of efficiency, quantity,
and speed. As a patron of these industrial values, society divorced itself from the natural cycle by producing artificial products designed to satisfy conditioned needs. It developed publicity and media to promote its own market and stimulate consumption. This was all done in the name of progress.

A side effect of this progress was rigidity. A domesticated system can become so ingrained with maintaining the established order that it grows inflexible. A natural system, structured by natural limits, flows with change without being threatened and remains open to the many manifestations of a quality existence. A closed society can stagnate and extinguish itself without necessary diversity. The closed system is victimized imaginatively and socially by its technology, paralyzing it into dependence. Individuals are forced to forfeit their autonomy and independence. Escalated needs, established by rapid consumption patterns, are inflated desires which cannot possibly be obtained by all the people. Walter Weisskopf says in his book, Economic Growth and Human Well-Being:

Only a small part of the modern economy serves the satisfaction of such biological needs ... Whereas 'need' means something that the human being can hardly do without, the term 'tastes' reduces the goal of economic activity to a game with sensual experience. This reflects, of course, the abundant productivity of the age; but it also renders meaningless the claim of satisfying 'human needs' as a justification for the gigantic apparatus of the modern economy.

The adoption of these "tastes" as "needs" requires some manipulation by industry. Expectation of "more" is a characteristic of a manipulative society which sets up goals and patterns of want
and consumption which can never be satisfied. As Ivan Illich states:

The Greeks replaced here with expectations. They framed a civilized context from a human perspective. The modern city replaces the classical city with a world of ever-rising expectations and thereby forever rules out all satisfaction.

The frustration that is unavoidable is comparable to the mythological hell concept of Tantalus, who stole ambrosia from the gods and now is resigned to stand, hungry and thirsty in receding waters overshadowed by fruit trees with receding branches. A frustrated people turn to violence for their release or escape into self-destructive habits.

Our man-made environment limits us to dependence and contains no variety and knowledge than that which is already known. What occurs is an imitation of the world we perceive, derived from the limited knowledge we have. This results in a benign society—safe and sure but not mature.

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We are sacrificing alternative faculties and attitudes which cannot contribute to an increase in wealth, resulting in an atrophy of emotions and FEELINGS, a neglect of the inner world, and in a deterioration of our capacity for receptive orientation towards our universe, towards nature, and our human environment, and thereby, of our aesthetic and religious faculties...

Walter A. Weisskopf

With all these problems with the environment and the society, what is the effect of industrialization on the human person? Is the person's relationship with the inner self, either biologically or psychologically, damaged? It would seem so. When a human being attempts to fit into the industrial mode and participate fully in
the institutions of the society, that person must conform to the mandates of the production system. This means the schedule of society becomes that person's schedule, regardless of that person's personal needs. The emphasis on production becomes a part of the individual's life. With goals of production serving as guidelines, the individual finds many time-consuming activities unprofitable, since their benefit cannot be measured in economic terms. The damage to the relationship of the human person to the inner self can be witnessed in four ways.

First, the human person is alienated from the self through subjection to the market. In the massive scale of modern industry, the human element is secondary to the production element. The person then becomes an adjunct to the machine, serving the system. Humanity becomes a commodity which can be bought and sold according to its economic value. Yet little, if any, importance is placed on the personal value of a human life. The system dictates a lifestyle, a location of residence, and an education consumption level which, if fulfilled, allows the person to be certified "productive." Without this certification, there is little possibility of successful achievement in the industrial society. Even the satisfaction gained from participation in the production system is minimal since the division of labor into extreme specialization limits the individual's impact on the end product. The individual is in charge of such a minute fraction of the maintenance of the industry that a sense of fulfillment is unlikely.

Not only is this specialization damaging, but extensive mechanization complicates discontent by denying the release of human
creativity and energy. The human person possesses an innate drive to be creative and, thus, acquire a sense of self-worth and dignity. In industrialized society, the machine does the creating with human persons monitoring the process. This defeats the sense of pride and accomplishment needed by the human self. With the efficient machine producing goods far more rapidly than a single person or group of persons, the individual must surrender self-reliance and rely on the products offered by industry. The human is no longer master of the machine but a servant to it, controlled by the artificial products of the market.

Secondly, the human person is estranged from the one-on-one relationship with nature. Biologically, the human person has to realize the relationship between himself and the rest of creation; otherwise, the individual puts the self above it. This detachment damages the self, for it is part of a whole not recognized by the mind. This promotes the objectivity of modern humanity with regard to the natural world. Never having experienced relationship with nature, the city child grows up believing that nature is the plastic pine tree in the park or the cow on the drive through the country. The modern city-dweller has little access to the natural world and little opportunity to live in the natural environment. Therefore, it is difficult to see that a relationship exists between the human person and the natural world. The benefits and precautions offered by the natural cycle are hidden by societal dictates. This heightens the aversion to natural limits, for limits are seen as impositions on personal freedom. The limits are enforced externally instead of
internally. In the same way, separated from nature, there is no particular allegiance to the laws of nature or concern for the damage done to the biosphere and, in the long run, to the self. Without the exposure to the rest of natural creation, detachment results in abuse.

The third way the relationship between the person and the self is damaged is in the lack of community and permanence in an industrialized society. The development of a community requires meaningful relationships with other persons. It is more than just a group of people; it is rather a group of persons with a commitment to one another, who help bolster each other in a bond of unity. There is genuine concern for the welfare of each individual involved in the community and each contributes something to strengthen the whole. It also serves as an identity factor in individual lives.

The industrial way of life is not conducive to the establishment of community by virtue of its impermanence. The pace of the industrial world inhibits the growth of community by building mobility into the people. No one remains for a long duration of time in one place. This mobility germinates in the restless populace, who continually search for happiness elsewhere. Permanence signifies stagnation. Yet, by their wanderings people further protect themselves from establishing ties with other human persons. Without roots they protect themselves from further pain. By estranging themselves from others, however, they isolate themselves from meaningful relationships that could be extremely rewarding. Relationships of a casual nature, which used to be secondary in priority, now override the
the primary relationships, which require intimacy and some degree of pain. This protective defense mechanism wards off growth and closeness.

This leads to the final and perhaps most crucial estrangement: the person is negligent of her own inner serenity, which can be found only by discovering and developing the inner self. This portion of the human person is not compliant with the industrial world. The inner self and its needs have taken a secondary importance to societal demands. Either the valuable time it takes to relax with one's inner self is considered a waste or it is continually postponed until the time is readily available. It will never be available, though, unless the person takes the time. It requires discipline and concentration that many lack.

This inner search is important in the development of the person. Without some sort of serenity governing one's life, the person is all the more vulnerable to the abuse of the industrial mode. As the frustration at one's impotence accumulates, overwhelmed by the pace, alienation cements the individual to hopelessness. The disintegration of the person, unfulfilled in work, leisure, or family, appears in the amoral practices of the culture. There is no tangible, uplifting force that can rescue the person from self-defeat.

After repeated doses of defeat, it is understandable why apathy is so common. Realizing the futility of fighting the system, the individual succumbs to the technological patterns and resigns himself to the status quo. Soon no other options seem feasible and the
alienated person settles down into neutrality, without inner freedom.

*****

Welcome to the world of wheels.

People come and people go,
Clipping life as best they know,
Programmed, plastic minds of steel,
Mirrors of a polished wheel.

Bedroom blessings, everyone!
Possess the other and you've won.
Control's the answer to the need;
Domination is our greed.

When our jobs do not fulfill,
We look elsewhere for a pill.
What we want's security,
Technique works and set us free...

Free...zip zip...free...
Zip...f...fr...free,ee.

*****

The violations of the relationships between the environment, the society, and the human person have prompted the crises evident in the industrial world. The more the world invests in highly-advanced technological industry, the greater the risk of incurable damage becomes. Relationships need acknowledgement and consideration in our solutions. Without this, our attempts to remedy the problem will only complicate the issue.

Many groups and individuals are now examining the problem and proposing alternatives to the intensive technology of the industrialized world. In researching this thesis, I have selected three authors, who describe the problem from their own insight and suggest changes accordingly. These three men, a social critic, an
economist, and a scientist, have focused on different aspects of society, based upon their background and experience. Yet, they all criticize the industrial mode for its neglect of the balance in the natural world. These three men are Ivan Illich, E.F. Schumacher, and John Todd.

Ivan Illich, born in Vienna in 1926, is a former Jesuit priest, who criticizes the institutionalization of society. A former vice-rector of the Catholic University of Puerto Rico, Illich has taken a special interest in the Third World development. He was a co-founder of the Center for Intercultural Documentation (CIDOC) in Cuernavaca, Mexico and holds degrees in history, philosophy, and theology. His interest on the effect of industrialization on the institutions can be seen in the books he has authored: *Celebration of Awareness* (1969), *Deschooling Society* (1971), *Tools for Conviviality* (1973), *Energy and Equity* (1974), and *Medical Nemesis* (1976). He has directed numerous research seminars on institutional alternatives in the technological society.

The late E.F. Schumacher (1911-1977) was born in Germany and educated in England and in America where he studied economics at Oxford and Columbia. He was the Economic Adviser for the National Coal Board in England from 1950-1970 and was appointed a Commander of the British Empire by the Queen for his work. He also served as Economic Adviser to the Prime Minister of Burma and as a director of the Scott-Bader Company and the Soil Association in England.

John Todd, co-founder of the New Alchemy Institute in Massachusetts, is the scientist. Born in Canada, he was an Olympic skier and small-boat sailor before he became an agriculture scientist and marine biologist at McGill University, University of Michigan, and the Woods Hole Oceanographic Institute. He has done extensive research into fish navigation and communication and has discovered a complicated chemical language developed by some species of fish. He is codesigner of the Prince Edward Island Ark, a self-contained living and working structure operated with solar and wind power. As a scientist, he sees the relationship between the microcosmic world and the macrocosmic world as crucial, and he builds tools with both realms in mind. The alternatives he presents are feasible, simple solutions based on a holistic philosophy.

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The critical analysis of Illich, combined with the spiritual revision of Schumacher and the scientific knowledge of Todd, produces a blend of the intellectual "Head," the attuned "Heart," and the creating "Hand" working together to cure the ills of an imbalanced
society. Recognizing the relationship between the environment, the society, and the individual person, these forces can be joined to effectively construct a responsive, maturing milieu - the coexistence of many forces in a harmonious union.
FOOTNOTES TO CHAPTER I


2 Genesis 1:28.


CHAPTER II

IVAN ILLICH: SOCIAL CRITIC

Man has developed the frustrating omnipotence to be unable to demand anything because he also cannot visualize anything which an institution cannot do for him.  
Ivan Illich

The energy policies adopted during the current decade will determine the range of societal relationships a society will be able to enjoy by the year 2000. A low energy policy allows for a wide choice of life styles and cultures. If, on the other hand, a society opts for high energy consumption, its social relationship must be dictated by technocracy and will be equally distasteful whether labelled capitalist or socialist.  
Ivan Illich

A negligence of the human factor and its limits, exhibited in the industrialized countries, handicaps the healthy maturation of a society. The growth mania, which has reached undeniable proportion, dictates a course of extinction for the industrialized nations.
Ivan Illich is well-known for his critical analyses of the various institutions which have gained such a manipulative stranglehold on our lives. He has identified the source of the systemic disorder of industrialized institutions, which base their operation on the hypothesis that machines can replace slaves. In so believing, these institutions have experimented with the idea that machines work for man and man can be trained and schooled in their maintenance. This experiment has failed and has led to the current crisis.

To even approach the problem and remedy it, Illich insists that analysis must indicate how the prevailing fundamental structure
of our present tools threatens the survival of humanity. In his seminal work, *Tools for Conviviality*, he writes:

It must be shown that this menace is imminent and that the effects of compulsive efficiency do more damage than good to most people of our generation.  

It is essential, then, to identify the range within which the present institutions and their tools frustrate people and, therefore, become destructive to society. He identifies six ways which demonstrate the "excesses" of our society and in which all people of the world are threatened by industrial development after a certain critical level of industrialization.

**Six Dimensions of a Broken Society**

The first dimension listed by Illich is overgrowth, which "threatens the right to the fundamental physical structure of the environment with which man has evolved." The precarious balance which exists between humankind and the ecosystem is now shaken by the impact of human beings and their machines. Three trends are blamed for the upset; overpopulation (an excess of people), excessive affluence (which prompts excess control over personnel), and faulty technology (use of an excess of energy). None of these can be singled out as the sole cause of the iniquity against the environment for that would result in a one-dimensional focus on a single aspect of the problem. Overpopulation has caused the abundance of people, who demand that their high consumption needs be met by their society. The land can only yield so much food to meet the needs of the populace. The affluence which characterizes our society,
especially in North America, generates a self-centered myopic viewpoint, favoring the wealthy consumer of goods. The modernization of poverty establishes new definitions of need and the educated masses begrudge the inequalities of the system. Material poverty is thought to be eradicated by mass production yet the demands are constantly shifting. In his book, Deschooling Society, Illich states that:

...once basic needs have been translated by a society into demands for scientifically produced commodities, poverty is defined by standards which the technocrats can change at will.

This affluence demands extended control by a bureaucracy or a government and leads to a highly centralized system. The possibility of regions governing themselves is unfeasible due to the increased financial and technological dependency on other areas. Regulations on shipping, manufacturing, and marketing must be established to assure availability to the consumer. Centralized government, which appears most efficient, legislates and controls distribution of goods and monies to assist the regions. Yet, if the region chooses this route, it forfeits its control of its own area and must conform to national governances. A cry already is heard, protesting the massive size of government and its controls, but with technological escalation, bureaucratic complexity develops.

This demonstrates that the solution does not lie in more of the same. Our industrial system produces a surplus of goods beyond the needs of the consumers, believing that more of the same industrialization will defeat poverty. However, this surplus uses valuable resources which are needed elsewhere or are rapidly dimin-
ishing. More of the same industrialization promotes increased consumption instead of rational satisfaction of need. It encourages obsolescence and defies the natural limits. We continue to ignore the biological limits of the natural sphere by extracting more of the same fossil fuels, which tamper with the delicate ecological balance. This biological degradation exposes our preoccupation with material wealth and growth, diametrically opposed to the ecological equilibrium of the biosphere. Hence, the strain in the relationship between the society and nature dangerously tests our chances of survival.

Overindustrialization, which is the second dimension, has fed off these escalated demands and resulted in an institutionalization of goods and services. Over-efficient tools are applied to facilitate humankind’s relations with the physical environment but instead increase its entanglement. Illich uses the term “radical monopoly” in his book, *Tools for Conviviality*, to relate a kind of dominance which restricts the consumer to one choice. This can easily be witnessed in the area of transportation.

As an industry which builds its own demands and responds to them, the transportation industry imposes a subtle monopolization over traffic.* Speed has been allowed to displace equity among

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*Illich distinguishes between three words somewhat synonymously used, as follows. Traffic is any movement of people from one place to another outside their homes. A subcategory of traffic is metabolic energy to use. The other subcategory of traffic is transport, which is any movement which relies on other sources of energy besides human metabolic exertion.*
people by crossing a critical threshold which can only be attained through transport. The new economy of transportation enabled many people to travel by rail in comfort; but, gradually, speed became another demand, and transportation began to dictate social configurations by the distances it helped bridge. Time is supposedly saved but only for a rich few who can afford the "luxury" of advanced transport and thus gain control of transportation by setting standards of travel consumption which the majority feels obliged to assume. The masses are enslaved to increasing distances which humanly cannot be travelled without artificial transport. Consumption of high doses of energy is both condoned and encouraged. As Illich specifies:

What distinguishes the traffic rich countries from the traffic in poor countries is not more mileage per hour of life-time for the majority, but more hours of compulsory consumption of high doses of energy, packaged and unequally distributed by the transportation industry.

The industry feeds this fetish by producing automobiles designed for private owners, as a solution to the inequity, further accenting the monopolization of mobility. Cities structure themselves around thoroughfares, built to serve the car, and transport eventually obstructs traffic by taking precedence over the walking public. Transportation interferes with traffic by breaking its flow, creating isolated sets of destinations only achieved through high speed transport and increasing the loss of time due to traffic. Time is quantified by speed, and distances are measured in minutes. Below some level of speed, motorized vehicles can complement or improve traffic, but
beyond that threshold it dictates the movement of people. This type of radical monopoly, cultivated by the industry itself, dominates personal productivity and limits human physical capabilities. What was once an effective tool now gains control of human beings and diminishes their autonomy. Society is preoccupied with moving masses, not with people's ability to move themselves. As the producer increasingly is controlled by the production, the person is rendered powerless to one type of staple, whose purpose originally was to satisfy. Time schedules and industrially-deformed perceptions of space regiment living. The habitual passenger is personally impotent to self-movement. Depending on the motorized conveyances for their convenience, the individual loses the ability to be mobile by human power. Production prohibits self-care and the care for others by advocating that institutional substitutes are more effective. This encourages dependency on the institutional product and reduces self-reliance. Illich explains that:

...any industry exercises this kind of deep-seated monopoly when it becomes the dominant means of satisfying needs that formerly occasioned a personal response.  

This has a pronounced affect on humankind's societal outlook.

Illich says:

Only contemporary man attempts to create in his own image, to build a totally man-made environment, and then discovers that he can do so only on the condition of constantly remaking man to fit it.

Overprogrammed to accept high levels of consumption, the third dimension of a broken society, humankind has allowed its consciousness to be governed by consumption patterns. Humankind has become oriented to live in a destructive, complex society by believing in "compulsory
consumption" and other institutionalized values. Illich comments:

When values have been institutionalized in planned and engineered process, members of modern society believe that the good life consists in having institutions which define the values that both they and their society believe they need.

A prominent example of such an institution is the school. The school, a radical monopoly of educational ideas and services, promotes consumption and controls the distribution of learning achievements. School conditions consumers to the production system by orienting them to the economic structure of society. This institutionalization of values declares bravely that people are born stupid and cannot learn until they are schooled into education. Each student is required to spend a standard number of hours in age-specific classrooms, acceding to the certified teacher's authority. The student then is rewarded by grades suitable for interpretation by the industrial world. Personality traits becoming of successful industrialists are cultivated here along with appropriate docility and psychological compliance with the rituals, rules, and morality of the industrial world. Besides these values, the education consumer is indoctrinated into the self-perpetuating myth that the more school attended, the more productive one can become. In addition, the successful technocrat continually must be reprogrammed by schools to remain abreast of the field. This academic addiction elevates the college graduate and postgraduate, who now sets the standards for the rest of society based on ever-increasing education in formalized system.

The most effectively indoctrinated students are the most valuable to the economic enterprise or state.
bureaucracy, and also the most successfully integrated into a particular stratum within the hierarchical educational process.

However, most learning is not gained from an institution, but from an individual's personal quest and discovery of knowledge outside the formalized system. In fact that very system tends to discourage creativity and self-initiated, cognitively flexible behavior by putting a dollar sign on labor and compulsive schooling. Illich comments further on this:

The modern university has forfeited its chance to provide a simple setting for encounters which are both autonomous and anarchic, focused yet unplanned and ebullient, and has chosen instead to manage the process by which so called research and instruction are produced.14

The major focus of the school system is to produce consumers, technically and philosophically prepared to be contributors to the national income. This objectification of human beings is divisive and detrimental to the human condition.

No matter how inefficient schools are in educating a majority, no matter how effective schools are in limiting the access to the elite, no matter how liberally schools shower their noneducational benefits on the members of this elite, schools do increase the national income. They qualify their graduates for more economic production...Schooling therefore --under the best of circumstances--helps to divide society into two groups: those so productive that their expectation of annual rise in personal income lies far beyond the national average, and the overwhelming majority, whose income also rises, but at a rate clearly below the former's.12

With such a drastic division of society, the overschooled and the underschooled compete in the job market, equally frustrated by the system, which has determined their learning, their behavior,
and their limits. There is little consideration for the intrinsic psychological effect on the human being.

A polarization of power due to new levels of production undermines a democratic political system. This is the fourth characteristic of a fragmented society which distinguishes the privileged from the underprivileged, with affluence for the former and powerless frustration for the latter. It divides the world into minorities lacking control over the political and industrial processes. Power is centralized in an elite group of schooled, wealthy technocrats, who by their very positions widen the chasm between themselves and the majority. On the surface, industrially-concentrated power can be obviated by income equalization. However, income equalization cannot be achieved for large populations as the status quo believes, except through the use of force. Universal wealth cannot be feasibly attained, even with escalated industrialization.

According to Illich, "Unchecked industrialization modernizes poverty. Poverty levels rise and the gap between rich and poor widens."¹³

As was mentioned previously, poverty levels rise due to the conversion of industrial staples into basic necessities which the majority cannot afford. The industrial substitutes do not meet the needs of the poverty-stricken, but rather create new standards of consumption unattainable for the majority.

The power gap widens because control over production is centralised to make most goods for the greatest number. Whereas rising poverty levels are due to the structure of industrial outputs, the gaping power lag is due to the structure of inputs. To seek remedies for the former without simultaneously dealing with the latter would only postpone and aggravate the worldwide modernization of poverty."
An elite group of technocrats emerge and command the society under the guise of increased and equalized income for all. "This type of modernized poverty combines the lack of power over circumstances with a loss of personal potency," concludes Illich.  

The fifth disruption to a working society is an obsolescence in the products of the radical monopolies. The constant renovation of industrial modes and tools binds the technocrats to a competitive immediacy. Value is bestowed on the most updated product on the market rather than on the durability and longevity of it. The consumer is drafted into the delusion of prestige by purchasing only the latest models prescribed by the industrial media. A belief that superior quality accompanies the most recent, upgraded product has been carefully sold to the public. However, this fosters the belief that any "new" product is of higher quality than an "old" one. Lasting competence in a tool seems unimportant next to the date of manufacture. It also amplifies poverty by setting up intolerable and addictive changes, which undermine stability. Illich states:

At this point the balance among stability, change, and tradition has been upset; society has lost both its roots in shared memories and its bearings for innovation. Judgment on precedents has lost its value.

In constantly attempting to acquire the fashionable and current improvements in tools, participate in a production system which polarizes the control of power, absorb the recent educational discoveries, contribute significantly to the overindustrialized organization of society, and consume the goods defined as necessary by the industrial culture, humankind finds itself overwhelmed and impotent.
It is a set stage for the tragedy of economic stagnation. Illich summarizes the problem:

Society can be destroyed when further growth of mass production renders the milieu hostile, when it extinguishes the free use of the natural abilities of society's members, when it isolates people from each other and locks them into a man-made shell, when it undermines the texture of community by promoting extreme social polarization and splintering specialization, or when cancerous acceleration enforces social change at a rate that rules out legal, cultural, and political precedents as formal guideline to present behavior. Corporate endeavors which thus threaten society cannot be tolerated. At this point it becomes irrelevant whether an enterprise is nominally owned by individuals, corporations, or state, because no form of management can make such fundamental destruction serve a social purpose.

Thus, a stranded people relinquishes control of society by allowing professionals to determine the future with their polished instruments, believing the experts have the foresight and knowledge capable of determining the best solution. Political institutions become the draft mechanisms to persuade the people into following the complex remedies, prescribing outlandish output goals.

The individual's autonomy is intolerably reduced by a society that defines the maximum satisfaction of the maximum number as the largest consumption of industrial goods.

People need to communicate, create, and caress to be fulfilled and truly human. They need to be able to focus on growth with each other and should not become prisoners to the machines that deny their humanness. When deprived of nature, of work, of the deep need to learn what is desired instead of what is dictated, the human person withers away. The extensive organization necessary in the industrial state stunts the social imagination by exemplifying it in aspiration
unattainable by the majority. Illich elaborates:

The overdetermination of the physical environment renders it hostile. Radical monopoly makes people prisoners of welfare. Men overwhelmed by commodities are rendered impotent and in their rage either kill or die. The corruption of the balance of learning makes people into puppets of their tools.

The personal cost of intolerable overefficiency is a scarring frustration. The damage manifests itself in serious mental and physical illnesses which we hand over to the medical profession to heal. The equally institutionalized professionals of the medical world attempt to cure the ills rather than to prevent them. Sedated also in cultural iatrogenesis, they are oblivious to the symbolic of psychological effect that living in a medicalized, industrialized society has on each individual's perception of one's own body. The medical branch of society is believed with inflated hopes to be the physician of all wounds. Yet, health is an interaction between human beings and nature, and, if an imbalance exists therein, illness can also result.

We have reached a point of irreversability in the illness so that we are immune to medical assistance. Recovery will have to be based on other levels, not on technical prescriptions. As compulsive consumers we expect to be treated in order to regain good health with little awareness that the cure lies in our own self-help.

It is that very autonomy which Ivan Illich ascribes to in presenting his solution for a crippled society.
Recovery of a Broken Society

To recover health society must regain itself to limits. The human being is the only animal known who can consciously change, prepare, or prevent problems; the only animal known who can understand these changes or hardships. Illich refers to this:

People must learn to live within bounds. This cannot be taught. Survival depends on people learning from unlimited progeny, consumption, and use. It is impossible to teach joyful renunciation in a world totally structured for higher output and the illusion of declining costs.

Despite Illich's reprimand of the industrial society he proffers an alternative construction to renew the homeostasis of the biosphere. He terms this recovery, "convivial reconstruction":

Professional goal-setting produces goods for an environment produced by other professions. Life that depends on high speed and apartment houses makes hospitals inevitable. By definition all these are scarce, and get even scarcer as they approach the standards set more recently by an ever-evolving profession; thereby each unit or quantum appearing on the market frustrates more people than it satisfies. . . . A just society would be one in which liberty for one person is constrained only by the demands created by equal liberty for another. Such a society requires as a precondition an agreement excluding tools that by their very nature prevent such liberty.

Conviviality designates autonomy and creativity in the intercourse among persons with their environment and with themselves, which is in sharp contrast to the "conditioned response" of persons to the demands made upon them by others and by a man-made environment. It decentralizes the system by shifting the responsibility to the individual and the community. Illich believes that the society must be reconstructed to enlarge the contribution of
self-reliant individuals and primary groups to the total effectiveness of a new system of production, designed with human persons in mind. Personal satisfaction and freedom are obviously valued in the system. Without this no productivity can satisfy human needs.

Does the society then discard the present tools and regress back to a preindustrial lifestyle? Illich defends his position by criticizing this narrow scope:

Our vision of the possible and feasible is so restricted by industrial expectations that any alternative to more mass production sounds like a return to past oppression or like a utopian design for noble savages. 22

This is contrary to his concept of conviviality. He is not declaring regression as the solution but a forward movement, enlightened by the wisdom of former ages. He calls for a balance of tools with human concern as a primary consideration.

What is fundamental to a convivial society is not the total absence of manipulative institutions and addictive goods and services, but a balance between these tools which create the specific demands they are specialized to satisfy and those complementary, enabling tools which foster self-realization.... The criteria of conviviality are to be considered as guidelines to the continuous process by which a society's members defend their liberty, and not as a set of prescriptions which can be mechanically applied. 23

Self-discipline serves as a guideline to the restoration of health in the individual and in the society. Success depends largely on this self-awareness and responsibility, which are responsive to the inner resources by which persons regulate themselves. Subjectivity becomes the key to real feeling and responsiveness in society with others.
The way to mature technology is the road to liberation from affluence and from dependence. This entails a social restructuring of humankind's personal reality itself in connection with the universe and its inhabitants. Illich expresses it so:

People will rediscover the value of joyful sobriety and liberating austerity only if they relearn to depend on each other rather than on energy slaves. 24

Illich submits the concept of "multidimensional balance of human life" to serve as a framework for evaluating the tools of humanity. If parameters are established within which human life remains viable, tools need to be restrained if they overwhelm human-kind and its goals. Limits of growth need establishment in service sectors as well as in the production aspect, to practicalize the paradigm of the people. He proposes a postindustrial equilibrium in modes of production founded of natural scales. In realizing that beyond a certain critical point, technology threatens the end for which it was designed besides threatening society itself. There is a need to designate and curtail those tools which exceed this critical point. Our tools must be reformed to reflect this.

Institutions then must reflect a human dimension, enlarging the range of each person's competence, control, and initiative, limited only by the individual's claim to an equal range of power and freedom. Illich dwells on specific examples of reconstruction of such institutions as the school and the medical profession. These must be "de-mythologized" as the "sacred cows" of our culture, which infringe on our autonomous ability to teach ourselves and heal ourselves. In so learning to serve ourselves, we alter our goals of
institutionalized consumerism and begin to take part actively in our own sustenance.

Illich also refers to "counterfoil research" which investigates in the opposite direction of the status quo. Three steps to such research are sketched in his book, Energy and Equity. First, limits on personal per capita use of energy theoretically must be recognized as a social imperative. The consumption of high energy output requires a ceiling to diminish dependence on irrational technology. Secondly, a range must be located wherein the critical magnitude might be found; that elusive threshold which present technology surpasses and further inhibits and prevent equity. Finally, each community identifies levels of inequality, that "harrying and operant conditioning that its members are willing to accept in exchange for satisfaction that comes of idolizing powerful devices and joining in rituals directed by the professionals who control their operation."  

By completing such a rigorous self-examination, a community can begin to restructure itself into a "convivial" unit. Illich emphasizes that it must not stop here.

The recovery of autonomous action will depend not on new specific goals people share, but on their use of legal and political procedures that permit individuals and groups to resolve conflicts arising from their pursuit of different goals. 

This metamorphosis may begin small but "only a widespread agreement on the procedures through which the autonomy of post-industrial man can be equitably guaranteed will lead to the necessary limits to human action," he warns. The burden remains on the whole of humankind, not just on fragments of socially conscious segments of
the world.

The choice as offered by Illich: either we live in estimated, recognized, and translated natural boundaries of human endeavor in a politically-determined, limited world or we live a compulsory survival in a planned, engineered hell of control and dependence. Only if individuals feel subjectively responsive to themselves and others will their actions be a sincere and true repentance. The synthetic world of increasing violence casts the person into the role of compulsive consumer and corrupts one's self-image. Illich answers the cry for resurrection:

The complement to a durable, repairable, and reusable bill of goods is not an increase of institutionally produced services, but rather an institutional framework which constantly educates to action, participation, and self-help.

He calls for the rebuilding of an ethical foundation for one's actions.

We must first construct a society in which "personal acts themselves reacquire a value higher than that of making things and manipulating people."

With a profound respect for other human persons and our environment we then begin to follow the directions of Ivan Illich who says:

Act so that the effect of your action is compatible with the permanence of genuine human life.
FOOTNOTES TO CHAPTER II


4. Ibid., p. 47.


7. Ibid., p. 45.


10. Ibid., p. 165.

11. Ibid., p. 51.


14. Ibid.

15. Illich, Ivan, Deschooling...Op. Cit., p. 5.


17. Ibid., xxiii.

18. Ibid., p. 12.

19. Ibid., p. 60.
FOOTNOTES CONTINUED:

20 Ibid., p. 65.
21 Ibid., p. 41.
22 Ibid., p. 63.
23 Ibid., p. 24.
27 Ibid.
29 Ibid., p. 146.
CHAPTER III

E.F. SCHUMACHER: ECONOMIST

For fruitful action, the whole of man has to be recognized. If this is not done and action is based solely on economic calculation as laid down in elaborate central plans, the only possible result can be coercion from the top. But what shall it profit? If coercion succeeds, freedom is lost; stultified by apathy and sullen disdain, the people sink ever deeper into misery.

E.F. Schumacher

The prevailing concept of efficiency rules the modern world not by itself, it rules it by the type of technology and the type of organization it has produced. A mere change of the concept remains wishful thinking. It will not be altered unless there is an incarnation...unless some people have actually got to work to produce new types of work, new types of organization, new patterns of consumption, new patterns of distribution of the population...have produced this and have shown it to be viable.

E.F. Schumacher

In an age of giantism, centralization, and automation, economists especially tend to focus on the factors of production with technical objectivity. They resemble generals plotting strategic courses for large blocks of mechanical squadrons, oblivious to the human element of which these are composed. The late E.F. Schumacher, however, stepped out of the stunted stereotype of the economist and presented ideas profoundly simple. Our tendency towards giantism promotes a detachment from the natural world and further magnifies the imbalance evident there today. Economics should be based on human needs rather than on scientifically determined calculations.
He proceeds to define the problem as one of philosophy and the physical application of that thought in practice. The question is not the centralization or decentralization of everything but rather a combination, resulting in a comfortable blend between centralizing Eastern metaphysics and appropriate decentralized Western technology.

First, he clarifies this distinction by elevating us to a metaphysical examination of the terms quality and quantity. Quality on the metaphysical, immaterial level transcends any measurement in quantity or structure. Immeasurable and obviously incapable of being forced into a uniform structure, it is diverse yet unifying in that the outcome of various indepth spiritual searchings leads us closer to God and a total unity with our universe. In effect, a centralization of spirits takes place. In the metaphysical world now, a decentralization of spirits interferes with the unity necessary in a balanced coexistence with our universe.

Schumacher says:

Modern man does not experience himself as a part of nature but as an outside force destined to dominate and conquer it.

Only a centralization of spirits with those of the universe will provide humanity with the philosophical basis for harmony with the world.

Quality on the physical level is determined by a concept of quantity and material. In other words, number is a priority. The more material something is, the more structure it requires.
Uniformity results as a stimulant for quantity and as a precaution against inefficiency and a possible decrease in number. This may occur if diversity is introduced and impedes the process. Limits, then, need to be established in a material world with quantity regarded as quality. Quality relationships cannot exist after a certain quantity threshold is passed.

The number I can work with as persons is limited...

Quantity, if excessive, suffocates.

On the physical level, therefore, centralization leads to uniformity and structure. Centralization stems from a drive for control and efficiency, whereas decentralization promotes diversity and individuality—individuality not in the selfish, egocentric interpretation of the word but in the sense of the unique fulfillment of each person’s potential developed for the common good. Schumacher finds that our present centralized system stresses quantity to the detriment of a quality existence. A decentralized system nurtures quality within itself without disregarding quantity, if quality is foremost. What is the quality factor that needs to be disclosed if society concerns itself with quantitative measurements? We treat things and people as uniform units not as quality subjects. Quantity cannot be totally disregarded but a focus must be on quality in the quantity instead.

What is prescribed then is a centralization of the immaterial spiritual world and a decentralization of the material world. As Schumacher says:

...at one level, we need to be split up into many, many groups and unity has to be achieved by some higher force that coordinates the thinking, feeling, striving of people....
On the other level, we need to avoid a hellish uniformity which can lead us to our own extinction. Schumacher cites four criteria for society's suicidal tendencies for which he provides four related solutions.

Four Criteria for Societal Suicide

The first of these four criteria is a tendency towards gigantism. A culture of affluence is constantly connected to the economic calculus, measuring success and progress in quantitative terms of size, number, and efficiency. The dollar takes precedence over the aesthetic concepts of happiness, growth, and satisfaction. As Schumacher puts it, "We have put everything under some concept of efficiency."^{6}

Originally the drive for efficiency was prompted by satisfaction of a massive need. Humankind detached itself from nature in order to technologically alleviate the production problem. This Western attitude triggered the imbalance which is more than evident today. Quantity dominated quality, and giant technology seemed the only practical course to follow. This fostered the belief that feasible solutions should be large in scale in order to satisfy the need efficiently.

All aspects, whether spiritual, moral, psychological, or political, need to be considered for their contribution to quality living—not as subservient to the aims of economics.

This was the first step.

The second criteria was a resultant tendency towards complexity. Giant technology involved intricate specialization on the part
technocrats, whose main thrust was quantitative. This specialization prompted the development of technological terminology and language. Without training and education in those terms, people were discriminated out of the job market and could not involve themselves in the production process. This provoked a mass migration of the talented, innovative persons from rural areas to urban job- and education- centers. Yet, massive, centralized technology eliminated through automation many of the manpower needs of the industry. The outcome was mass unemployment.

This is more than evident in third world countries which are attempting to Westernize their production processes. The narrow imitation of the Western techniques amazes Schumacher. To think that the only way to promote economic growth in the so-called underdeveloped countries is to imitate as closely as possible the current practices of the advanced countries (or perhaps to do even better by jumping the intermediate stages) and to force every time-honored institution into the service of purely material aims of Western inspiration, betrays not only an astounding lack of imagination, but also a truly ominous lack of awareness of the dehumanizing deformities of the Modern West.

Migration from the rural areas has clogged the industrial cities with frustrated jobseekers, leaving the surrounding regions poorer. In many industries, frustration is complicated by the tedium of fragmentary jobs. In essence there is no "real productivity" for humanity. "The neglect of noneconomic realities," states Schumacher, "seems to me the principle barrier to worthwhile progress in the very field of economic development with which we are concerned."  

The third criteria which equally discriminates against Third
World nations is the criterion of expense immensity. The amount of capital needed to establish a giant industry is far beyond the resources available to these nations. A capital-intensive industry demands money, resources, and expertise, all of which can only be obtained from the First World inventors of such technology. Third World hopefuls then become dependents on the industrialized nations. Westernization is believed to be synonymous with economic development. With such a decision, material capital is placed above human capital and capital-intensive technology is believed to solve the problem of production. However,

This illusion is mainly due to our inability to recognize that the modern industrial system with all its intellectual sophistication, consumes the very basis on which it has been erected. To use the language of the economist, it lives on irreplaceable capital which it cheerfully treats as income. I specify three categories of such capital: fossil fuels, the tolerance margins of nature, and the human substance.

These three categories of capital reflect our lack of value for natural and human substances, which are overrun by our concern for material income. Such an imbalance of values should never be allowed to occur.

Scientific or technological 'solutions' which poison the environment or degrade social structure and man himself are of no benefit, no matter how brilliantly conceived or how great their superficial attraction.

This leads directly into the final criterion of social suicide ---increasing violence in our modes of production. This is perhaps the most crucial of the four for it predicts a retaliatory reaction of the earth and its human subjects against the abusive technology.
This change in the quality and quantity of production produces a crisis environmentally, societally, and personally. The dependence on limited fossil fuels to power the massive industries dictates a short lived power source. Termination of such fuels is now inevitable. Even with unlimited technological power, we are faced with a fuel crisis, resulting in curtailing power for these industries.

As the world's resources of non-renewable fuels—coal, oil, and natural gas—are exceedingly unevenly distributed over the globe and undoubtedly limited in quantity, it is clear that their exploitation at an ever-increasing rate is an act of violence against nature which must almost inevitably lead to violence between men.\[12\]

Thus societally we run high risks.

In the same vein these "inhuman" technologies abuse human potential and ignore the natural limits and rules governing nature. Beyond a certain limit technology develops its own rules and principles regardless of man and nature. It tries to be limitless, contradicting the self-balancing, self-adjusting, and self-cleansing properties of nature. Schumacher elaborates on this:

...that economic growth, which viewed from the point of view of economics, physics, chemistry, and technology, has no discernible limits (and) must necessarily run into decisive bottlenecks when viewed from the point of view of the environmental sciences. An attitude of life which seeks fulfillment in the single-minded pursuit of wealth—in short, materialism—does not fit into this world because it contains within itself no limiting principle, while the environment in which it is placed is strictly limited.\[13\]

This leads to a disastrous imbalance and a provocation of environmental retaliation. A system without limits trying to exist in a natural biosphere based on limits is destined to build
tension and risk a reaction.

What is quite clear is that a way of life that bases itself on materialism, i.e., on permanent, limitless expansionism in a finite environment, cannot last long and that its life expectation is the shorter the more successfully it pursues its expansionist objective.

Obviously, then, we will soon reach the peak of abuse and then will regret the folly in our techniques. Schumacher goes on to state that three crises emerge in the modern world.

First, human nature revolts against inhuman technological, organizational, and political patterns, which it experiences as suffocating and debilitating; second, the living environment which supports human life aches and groans and gives signs of partial breakdown; and third, it is clear to anyone fully knowledgeable in the subject matter that the inroads being made into the world's nonrenewable resources, particularly those of fossil fuels, are such that serious bottlenecks and virtual exhaustion loom ahead in the quite foreseeable future.

There is an immediacy in the warnings of Schumacher which cannot be overlooked. Extinction is the outcome of the present course that society follows. The goal of solving all the production problems of a modern society may be reached, but the damage done as a result of it leads us further from a healthy society. It is with the best of intentions that humanity strives for efficiency and yet it defeats the ultimate desire for a stable culture. Schumacher remarks:

...this concept, this very Good-orientated concept of efficiency,...has led us into the whole mythology of economies of scale. More specialization, more division of labor, more uniformity, more mindlessness—production becomes ever bigger, ever more complex, ever more capital-intensive, and in a special sense, ever more violent.

After one examines the seemingly insurmountable problems...
specified by Schumacher, frustration seems unavoidable. How is it possible to find feasible solutions to the rampant ills described here? If the present course of action is unsuitable, what alternative is there? Schumacher exhibits no hesitation in returning to that source from which we originally departed: nature.

I have no doubt that a callous attitude to the land and to the animals thereon, is connected with, and symptomatic of, a great many other attitudes such as those producing a fanaticism of rapid change and a fascination with novelties—technical, organizational, chemical, biological, and so forth—which insists on their application long before their long-term consequences are even remotely understood. In the simple question how we treat the land, next to our people, our most precious resource, our entire way of life is involved and before our policies with regard to the land will really be changed, there will have to be a great deal of philosophical, not to say, religious change. It is not a question of what we can afford but of what we choose to spend our money on. If we could return to a generous recognition of the meta-economic values, our landscape would become healthy and beautiful again and our people would regain the dignity of man, who knows himself higher than the animals but never forgets that noblesse oblige."

At this time Schumacher feel that the facilities the Creator put at our disposal for the purpose of attaining an end are not being used. We don't even make up our mind what our end is. We are using them only because they are there. We know now that we have overshot the mark of needed goods by massive technology, fueled chiefly by nonrenewable fossil fuels. We also see a damaging tendency to automate and mechanize everything for our increased leisure. And, thus, realizing the economic misery abundant in our society, we search for the solution. Yet, we know our search must be conducted with utmost delicacy, with a painstaking
reverence for the natural sphere which we have damaged. Schumacher stresses prudence in our actions:

Anything so complicated as a planet, inhabited by more than a million and a half species of plants and animals, all of them living together in a more or less balanced equilibrium in which they continuously use and reuse the same molecules of the soil and air, cannot be improved by aimless and uninformed tinkering. All changes in a complex mechanism involve some risk and should be undertaken only after careful study of all fact available.

We will not find the solution among physical techniques. To find peace in the confusion, the human person needs to adopt a number of metaphysical ideas for a groundwork, even if these are directly opposed to nineteenth century ideas lodged inside. Humanity needs to see itself in relationship to the cosmos and discover its own position therein. In acknowledging different "levels of being," humanity realizes the inadequacy of physical, scientific methods in dealing with metaphysical subjects of politics and economics. A constant struggle exists in attempting to reconcile these opposites.

We need a transcending medium. That transcending medium, prescribed two thousand years ago in the Gospel, is love. This cannot be communicated in techniques but must involve in-depth forces. We cannot allow divergent problems which require transcendence for resolution to become convergent problems, which need only formulas for solution. This would reduce the mind to the mere function of a machine, denying the emotion and spiritualism it is capable of. Divergent problems involve the whole person not just the reasoning powers. They require higher level solutions.

Schumacher terms the element needed in society as the TLC (for tender loving care) factor, which would result in incarnation.
of head, heart, and hand in a spiritually-attuned, humane society. It involves a paradigmatic shift from the present divorce of hand and soul to a marriage between them.

The truly healed person is one who is in touch with their center. All the detailed knowledge of theories and facts or the acquisition of bits of knowledge about everything will not make the person whole. Schumacher presents this beautifully.

All subjects, no matter how specialized, are connected with a centre; they are like rays emanating from a sun. The centre is constituted by our most basic convictions, by those ideas which really have the power to move us. In other words, the centre consists of metaphysics and ethics, of ideas that—whether we like it or not—transcend the world of facts. Because they transcend the world of facts, they cannot be proved or disproved by ordinary scientific method... (But) they must be true to reality, although they transcend the world of facts... If they are not true to reality, the adherence to such a set of ideas must inevitably lead to disaster. 19

Nothing, including education, can help unless it contributes to the wholeness of humanity. If teaching or preaching does not lead us to develop our full human potential and clarify our fundamental convictions, then they will not lead us to maturity. It will not remedy the damage done to society.

If the person is truly in touch, her lifestyle will reflect that wholeness: similarly if all persons are in touch, the society will reflect wholeness. This appears utopic and romantic in its expectations, but certainly what is in actuality now is a far cry from either of these. In fact, the society is in deep trouble and hold little promise of survival. Without acknowledging real human needs, we complicate
the problems by our attempted solutions. The situation will not improve by continuing in the same direction. Schumacher admits this places high expectations on the world because,

...the present consumer society is like a drug addict, who, no matter how miserable he may feel, finds it extremely difficult to get off the hook.

But, being a revisionist, he designates amendments to the current technology which would reflect the TLC element in their design.

In examining the purpose of technology, we find its primary task is to lighten the burden of work human beings have to carry in order to stay alive and develop their potential. This task is fulfilled in some specific instances but not so in whole societies. In some instances, the task is increased due to the tension and lack of creative outlets for the individual worker.

If such is the case then our technology needs to take on a new face, one of human dimensions. Schumacher proposes a balance in the challenge to simplify the forward movement to a less-expensive, less-violent technology. We need to transform elements used in the present system into revised tools conducive to our philosophy of relationship and then adjust the most advanced technology to the requirements of what Schumacher terms an "intermediate technology."

Schumacher refers frequently to Gandhi who said that the poor cannot be saved by "mass production" but by "production by the masses." Gandhi clarified and distinguished the two by saying that "mass production" assumes the country to be wealthy since it is based on sophisticated, highly capital-intensive, high energy-input dependent, and human labor-saving technology. "Production by the masses,"
on the other hand, utilizes the priceless resources which are found in all human beings—brains and skillful hands—and supports them with reliable tools. Whereas mass production often disregards the ecological, social, and personal damage it deals to the human person—in pollution, violence, self-defeating automation, and abuse of non-renewable resources—production by the masses makes use of modern technology that is compatible with the laws of ecology, scarce resources, and the dignity of humanity. Gandhi reflects the purpose of machines when he says:

Every machine that helps every individual has a place, but there should be no place for machines that concentrate power in a few hands and turn the masses into mere machine minders, if indeed they do not make them unemployed.

The intermediate technology proposed by Schumacher is a bridge between primitive technology used by the cavemen and the super-technology of the rich. It is not reserved for any particular strata of society, but is one to which all nations and peoples may gain admittance. Truthful knowledge does not commit us to a science of giantism, supersonic speed, violence, and the destruction of human work. Our present usage of knowledge is merely one way, not the best way. Perhaps, it is worse, since it does not consider wisdom and damage in its techniques.

It is this small-scale technology which Schumacher proposed as an alternative to the tendency of giantism of our society. This type of technology brings the human element into the forefront and
allows human beings to nurture their own potential without being slaves of the machine.

No doubt a price has to be paid for anything worthwhile. To redirect technology so that it serves man instead of destroying him requires primarily an effort of the imagination and an abandonment of fear.22

Many changes are going to have to materialize before the true benefits of small-scale technology can be witnessed. Production techniques need actual changing before human logic will accept the change in philosophy on which it is based. We are powerless to alter the system without some actual proof of its worth. A reduction in the size and expectations of our demands is going to have to be dealt with. A conversion of the high energy-input machines in existence now to a decentralized, appropriate set of tools, which develop a skill and the use of human labor, will mandate a shift in our consciousness to the assimilation of the idea that "small is beautiful." Architectural changes conducive to smaller areas will help us to be more conscious of the homeostasis needed between ourselves and nature. With this our attention reverts back to nature's limitations with which we need to coalesce. New patterns of population distribution emerge as the job markets expand in local communities, rural and urban. Each area is then forced to develop tools with which its own needs can be met. These tools constitute the appropriate technology, independent of fossil fuels, using renewable resources for their power.

An example of this type of technology is the snail tractor designed by the Intermediate Technology Development Group of which
Schumacher is the founder. This small-scale tractor consumes one-tenth of the cost, and employs two persons instead of one. This was one of the solutions presented to the Third World agricultures, which sought to employ tools without increasing unemployment.

Along similar lines the tendency towards complexity is resolved by a simplification of tools and lifestyles. The tools available will be blueprinted, produced, maintained, and repaired on the local level, using local expertise, ingenuity, and materials. The door opens then to all types of diverse tools, each suited for the specific locale and its inhabitants. The lifestyles equally will reflect a simplicity due to the decrease in production levels. Satisfaction of needs is possible though in a simplified society in tune to the basic needs shift from quantity to quality, with people receiving both pleasure from their creations but also from the durability and practicality of it in use. Schumacher speaks of this new philosophy of work:

Above anything else there is a need for a proper philosophy of work which understands work not as that which it has indeed become, an inhuman chore, as soon as possible to be abolished by automation, but as something decreed by Providence for the good of man's body and soul.²³

Labor cannot be seen as a negative requisite of society, which is strictly the nine-to-five routine of boredom; but it rather must be considered as a rewarding complement to leisure. A new idea surfaces of work and leisure as compatible and not escapist. When one derives enjoyment from creating an item which will last and be attractive, one transcends the distinction between leisure
and labor and finds them united to satisfaction. Schumacher extrapolated this concept from Buddhist economics, where the human being utilizes and develops faculties and is thus liberated from the monotony of every day routine. Buddhist economics calls for a blend of religious and spiritual values while taking advantage of the benefits of modern technology. The technology frees one from the mundane tasks of drudgery but allows the freedom to create and gain pleasure from invention.

There are three criteria in Buddhist economics by which we of the West could benefit. The first is giving human beings a chance to apply their skills and develop their own potential. Secondly, individuals must overcome their egocenteredness and join with others in a common task of meeting the common needs. Finally, society must brings forth goods and services needed for a becoming existence. Schumacher says:

*Economic misery is something altogether different from mere poverty; it's a scandal and signifies a breakdown of the natural order, for it prevents men from being human.*

Buddhist economics takes into full consideration the economic needs of human beings in order to allow for the nurturance of each person's potential. Full employment in Buddhist culture is more important than GNP for it values the human need to work and be a productive member of society. Simple lifestyles exhibit the favourable patterns of consumption, producing high degrees of satisfaction through low consumption, which allows people to live without great pressure and strain.
There is a great deal of wisdom in capital cheapness, which Schumacher declares is the remedy for the third problem of expense immensity. Unlike Buddhist philosophy, the intention of many small, independent nations to be powerful and rich further enslaves them to the rich and powerful. Instant affluence with no responsibility or resourcefulness by the small nation leads only to intensified problems that the present industrialized nations have taken centuries to develop. Culture shock of this sort is equally dangerous if the society is forced to abandon its old myths and practices in order to adapt the new. These beliefs on which the culture maintained itself cannot be eradicated without extreme alienation of the people in that society. Such alienation can be more pronounced in a culture victimized by industrialization than by a society which has gradually assimilated to that.

Intermediate technology requires little capital to adopt in comparison with the astronomical amounts required for the high speed technology peddled by the industrialized nations. Nor does intermediate technology require an abandonment of the culture into which it is adopted. It is a feasible alternative to the capital-intensive technology in demand today.

In considering a solution for the violence now incurred on our planet, small-scale technology diminishes the abuse.

Small-scale operations, no matter how numerous, are always less likely to be harmful to the natural environment than large-scale ones, simply because their individual force is small in relation to the recuperative forces of nature.
Damage can occur from any operation but individual communities are more likely to care for their little bit of land than large-scale corporations, which forget their responsibility to the land. Nature has tolerance levels and little skirmishes can be handled but massive assaults cannot. If we maintain spiritual principles of stewardship toward the land and exhibit deep concern for nature in our practices, we are more likely to regulate responsibility on a small level. We are then attuned to the universe of which we are a very real part and willing to take responsibility in our management of the world. Philosophically, we appreciate the relationships in our world and value the balance so essential for harmony with our world.

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The implications of such a shift are infinite. We are not prepared to adopt a massive change in our status quo. Schumacher, however, does not call for a"massive change." In fact, such massive change denies the very essence of his philosophy. He calls on individuals, villages, cities, and nations to strike out not against society but for society—for the human creativity and control for which we all so vigorously proclaim belief. He calls on each person to be just that—a person—and depend on their own human creativity and control for which we all so vigorously proclaim belief. He calls on each person to be just that—a person—and depend on their own human capabilities for their own sustenance. Likewise, he does not attempt to convert all to one mode of pro-
duction and one set of philosophic principles. This would be extremely presumptuous and impractical for any philosopher to insinuate one viewpoint was universal.

Instead, he provides insights and solutions promoting action to renew the metaphysical awareness of our role in a balanced world. In answer to the question, "What can I do?" he replies:

The answer is as simple as it is disconcerting: we can, each of us, work to put our own inner house in order. The guidance we need for this work cannot be found in science and technology, the value of which utterly depends on the ends they serve; but it can still be found in the traditional wisdom on mankind. 26

What Schumacher suggests, then, as a remedy is not entirely new, although it may be stated in different terminology than any previously used. The Beatitudes themselves lay the groundwork for his solutions and their underlying philosophy. It may seem strange to link these precepts with matters such as economics and technology; yet, if our actions are an embodiment of our thoughts, it is not so unrelated. Schumacher draws the parallel simply:

We are poor, not demigods,
We have plenty to be sorrowful about, and are not emerging into a golden age,
We need a gentle approach, a non-violent spirit, and small is beautiful,
We must concern ourselves with justice and see right prevail,
And all this, only this, can enable us to become peacemakers. 27
FOOTNOTES TO CHAPTER III


5 Ibid., p. 54.

6 Ibid., p. 56.


8 Ibid., p. 366.

9 Ibid., p. 364.


11 Ibid., p. 31.

12 Ibid., p. 57.

13 Ibid., p. 27.

14 Ibid., p. 139.

15 Ibid.


18 Ibid., p. 127.

19 Ibid., p. 87.

20 Ibid., p. 144.

21 Ibid., p. 32.
FOOTNOTES CONTINUED:


23 *Ibid.* p. 34.


CHAPTER IV

JOHN TODD: SCIENTIST

The messages from the living world are building to a desperate cacophony. For humanity to extend the human experiment and to survive its present travesties against the biosphere there will need to be complete attitudinal change towards nature.

"Nature is our primary ally, the future must be nothing less than a transformation away from hardware intensive and exploitive societies to ones that are informationally rich, co-evolving in an intimate partnership with the living world."

Since the age of rationalism began, logic and scientific fact have superceded the intuitive thought processes of humanity. The emphasis on formal reasoning has displaced the previous spiritual factor and elevated scientism to its present priestly position. Science and its technicians reserve esoteric authority on most crucial social issues. It is the scientist who determines the safety, practicality, and efficiency of proposals for social betterment. With their stamp of approval it is unlikely the proposal will be rejected.

Accompanying this intellectual transformation was the belief that complexity and scientific methods were the only feasible choice for a progressive industrial state. This choice was planned, constructed, and controlled by the scientist, who claims responsibility for discovery.
John Todd is an anomaly in his profession. Unlike most of his colleagues in the scientific profession, his viewpoint does not reflect strict, strategic scientism. He paradoxically fuses science with the practical philosophic reals. His philosophy is based on a balanced co-existence of all life forms in the habitat in which they are found. It is with this consideration for the ecosystem that Todd puts into practical form the ideas necessary in instituting a technology conducive for prolonged, harmonious existence.

Recognizing the interdependency of plants, animals, and human beings, Todd ascertains the flaw in our society to be the deliberate renunciation of our co-existence with the biosphere. In the drive for quick production of large quantities of products, the society has removed itself from the ecological balance.

The earth's mantle is shaped by and inextricably intertwined with the forces of the weather and the seasons. It is an ancient and sacred relationship. Only within historical times have men tampered with it, tearing at the threads for short-term gain rather than protecting and extending the environments of which they are a part.

He warns of a powerful dichotomy which threatens people and place alike. "Human societies, unlike most plants, almost all insects and many mammals, do not oscillate in harmony with the seasons," he says. He formulates three factors which aid this imbalance and which reduce humanity to dependents.

Three Factors Promoting Imbalance

The first factor he defines as secularism and the resultant myth of science. In allowing pragmatism to override metaphysics,
we as a culture forfeit out higher mental abilities of an abstract nature. That which deserves credibility is that which can be systematically proven, using structured cognitive processes. Speculation merits little consideration since it cannot be scientifically validated.

This reveals itself in the diminishing appreciation of the aesthetic disciplines of art, music, drama, and spiritualism. Seeing these as secondary values, our professional society delegates these to the sidelines and invests little importance in them. We settle into the material realm, oblivious to the possibilities beyond.

This viewpoint increases the prestige of scientists, who hold the power as masters of logic and technique. The resultant elitism is destructive to community, since all people cannot acquire the specialized knowledge that designates them as professional. Even within professional circles, a practitioner who does not assent to the popular paradigms is ostracized for nonconformity.

Scientist and their science are not immune to the economic forces in society. Dependent on society for financial security to continue their research, the sciences and technologies are shaped by these very forces which originally elevated them to such a high position. They are equally responsible for the problems confronting us today in that they have not considered the consequences of their actions. The problems stem from this lack of consideration. The technological inventions are damaging the world. By thinking only of the immediate result, short-term gain committed them to long-term
grief that is only now beginning.

By following the myth that science is rational, society irrationally disregards the natural limits and cycles on which it is based. Not attuned to these, it ignores the interrelationships and gravely endangers its survival. The rise in industrial and global societies as produced a discontinuity and a cleavage from nature. Presently, science denies the ecological sphere in its secular mindset and devotes its time to calculable, physical outputs. In so doing, it cuts itself off from the depth of being.

The second detrimental factor in a society is the belief that only large-scale technology can resolve the material shortages in the world. Human exploitation of environments is obvious in the industrial techniques which lead to the eventual breakdown of a rich, biological organization. Technology supercedes nature by convincing increasing numbers that large-scale machinery is the key to efficient, progressive production. Industrial nations set standards of hardware-intensive machinery to be acquired by all "advancing nations." Todd states:

"Industrial nations have exploited the globe for raw materials and commodities and then have made the third world into markets for the manufactured feeds, fertilizers, medicines, and technologies.

Even our agriculture has been molded into an industrial image through chemical tamperings which synchronize the maturation to meet the time schedules of a machine. Our agriculture is based on cheap, widely-available fuels of oil and gas, which are diminishing rapidly. Farmers have been slowly brainwashed to see nature as a
foe and chemicals as friends. Our use of oil and gas-derived nutrients, high-energy consuming technology, and industrial regulators has diminished our contact with the land that provides us with our livelihood.

The substitution of solar based inputs including draft animals, human labor, biological regulators, and land restoring processes by highly concentrated forms of energy, oil, and gas, which can only be biologically replaced extremely slowly has placed humanity well out on a limb.

To meet these escalating demands, the energy industry preoccupies itself with oil drilling and nuclear fission which are hardware-intensive, large-scale solutions. Their effect on the environment is a secondary concern if they are potential energy producers. Politically, the industrial state encourages tax deduction and exemptions for the energy producer. Controlling the large power sources, they easily manipulate society into meeting their political and economic demands. Todd comments:

If we as a nation were to spend half as much money on creating low-cost, single-family or small community-size sources of pure energy, as we do on oil exploration or developing potentially dangerous nuclear generators, it would then be possible to solve a number of environmental and social crises that massive, centralized power-generation plants will never be able to cope with. Yet, it is unlikely that enough small-scale power research will be supported by governments or large industries. This is because of a contemporary fact of life, namely: ... he who controls the supplies of power, directs society, and a massive deployment of small pure-energy units would take power away from the relative few.

Power industries are not willing to relinquish their control of the populace and lose their monopoly of political and economic power. There is a sense of security for the status quo in knowing
that the control is in their hands. Being on top, they are hesitant to try any alternative that may diminish their power.

The third factor Todd points out also concerns the relationship with the land and the decreasing diversity of society. The overall instability of many major eco-systems, not to mention the long-term survival of humanity, seems threatened by the reduction of wild or relatively undisturbed lands. Increasingly, monoculture has consumed the wilderness which provided a release for nature's suppressed spontaneity. Few lands are left as wild lands to thrive and grow uncultivated. Grain and livestock legislate the use of land along with real estate subdivision. The land is used to meet the demands of society in the way that society dictates. This diminishing biotic diversity in the ecosystem is further intensified by pressure from rising populations whose priorities are in conflict with those that characterize healthy and stable eco-systems. Global biotic homogeneity is the result of these processes of urbanization and agriculture. If we do not revert back to nature and allow these lands to return to their natural state, we may increase our own peril.

This same limited scope is displayed in technology. In allowing large-scale technology to take precedence over the production system, society overlooks dozens of small-scale alternatives which provide a necessary diversity in our culture. The important part of social variability for a human community is lost. A balanced society requires multiformity to keep it growing and alive, just as a healthy ecosystem requires various foliage and shrubbery, complemented by animal life, to balance itself. This
narrow approach reduces the options of society and promotes the conditioned interest in efficiency and quantity, now maintained by the industrial power structure. Land and human beings become commodities for the profit motive. The role of the individual is reduced by relinquishing tasks to machines and specialists. This simplification and impoverishment of human life leads to violence induced by the boredom of industrial tasks. Visible in society are the reactions of a frustrated, rootless people, unable to be self-sufficient.

All these factors interfere with the possibility of healthy, holistic survival in the world. Todd remarks:

The contemporary colossal sense of scale, combined with the fragmentation of knowledge by the scientific establishment, has effectively blocked the development of an alternative for the future that is humble and yet ecologically wise.

The outcome if we continue to follow the same course as we now do is apparent.

To continue to ignore the biological lessons in phenomena such as these may prove in the long run a little bit like serving cyanide to the pilot of an aircraft, while pouring champagne for the passengers. Fun for a while, but not exactly adaptive... The messages from the living world are building to a desperate cacophony. For humanity to extend travesties against the biosphere there will need to be complete attitudinal change towards nature. Nature in all its states and especially its diverse mature ones, will need to be seen as a living entity from which patterns can be drawn to create our future food culture systems.

From an historical review of the holistic perspective, it appears that only those societies which loved the earth, treating
it as a sacred entity, survived against the societies that didn't. This alone indicates our powerful obligation to protect not only ourselves but every living entity. For humankind to restore and reconstruct the earth it will have to begin rethinking and revamping its mindscapes, the abstract area which our minds inhabit, and the landscapes, which our bodies occupy. Our present knowledge will have to be re-integrated into a healing wholeness, and land tenure-ship will have to encompass the vision that a sacred ecology can provide.

Todd's revision calls for a linkage between what he terms the "conscious evolution" and the "evolution of conscious." Human-kind is not evolving according to its real destiny, and past ages have just been a prelude to an intimate spirituality of the future. We are just beginning to comprehend the vast capacity of nature, the mind, and the heart. The fullness of our relationship with our planet can only be reached in a realization of the interdependency of mind-scape and landscape. Our landscape, the world, shapes our mind's territories. Previous ages have been limited in their concept of the earth as being intimate to them by the view of land and nature as being detached from them. This explains the grounded, manipulative treatment of nature in the past. In looking at our present society with a new consciousness emerging, multitudes of contradictions appear in our lifestyles. If we are connected with our universe, how can we justify our negative conduct?

Todd says that we need to counter the trend towards uniformity and efficiency with alternatives which recognize the interdependencies
of life. Piecemeal thinking has about run its course, and an appropriate alternative with some kind of holistic comprehension could produce a significant change for the future. He adds:

There will be no panaceas, no single solutions. It will have to be based on a system of knowledge that reestablishes kinship with all life and a way of seeing the interdependent nature of all life.

Todd has begun this process by examining the microcosmic world in which he has discovered the interrelationships and adaptive processes of nature. Now, he and his associates are attempting to duplicate the restorative processes of nature. The objective is to move out of the planetary perspective without losing it and move into a microcosmic one, aware of the consequences of one's actions.

We believe that the quality of the whole depends on the quality of the smallest parts, so we concern ourselves with what we hope are micro-solutions.

Todd fuses ethic with a scientific commitment to the microcosms by returning to a "considerate stewardship of the land," Stewardship recognizes a spiritual, biological, and ecological balance of the environment one is and responds to it gently. After studying these elements of the natural world, Todd predicts that humans can build upon the cycles, maintaining the structure of the environment*

*In his research, he notes a response of aquatic life to change in water nutrient value and in temperature with the sun's heat, which typifies the belief that all facets of nature are dependent on one another for a whole, healthy function to be possible. Recognizing these factors brings one closer in relationship with one's surroundings and also opens up new dimensions of food growth, energy production, temperature regulation, and living structures.
Scientists themselves are in prime positions to realize this interrelationship and build upon it. Yet with the elitism present in the scientific world, the populace would never gain that knowledge. The direction of science currently is powerfully influenced by its patrons, namely the military and large corporations. To remedy this, a "lay science," which is deeply ethical, totally ecological, and, consequently, reconstructive, needs to be instituted. Acting on behalf of all people, science would search for new techniques and options to restore the earth and create a sense of community along ecological lines. Todd states that a linkage between society and scientific purpose be made with the aim of creating a reconstructive knowledge that will function at the basic levels of society. This "lay science" would alleviate the oppression of the earth and its people. An organic method of science would be a cooperative "brainchild of many" involving gardeners, farmers, scientists, and industrialists all in collaboration for the good of the whole. It would explore diverse alternatives compatible with our enlightened understanding of natural limits. Without divorcing itself from the spiritual realm, it would respond to the religious connotations of oneness and be a vivid example of many disciplines cooperating to form a solid, balanced whole.

We suspect that the next major human advance may prove to be the substitution of strategies from gleaned from nature deriving their primary support from natural systems for present day predominately hardware strategies requiring high levels of energy to operate society.

A lay science eliminates the elitism of our present science
by allowing all to be scientists. A tight circle of professionals will not control and distribute knowledge. Instead, the information is dispersed, allowing for greater acquisition.

In dealing with the problem of scale, Todd states:

"For us the key to change was linked to scale. If an adaptive future meant working with tangible wholes rather than abstraction, then the scale of our scientific inquiry should be much reduced yet involve, at the same time, the vital systems which sustain humanity."  

Small technologies are adaptive biologically as well as politically and spiritually. It is easy to detach oneselfs from the damaging effects of our industrialized technology if we are in a culture of "bigness" but more difficult to eradicate if we reduce our scale of being to grasp a feeling for interrelatedness. Biologically, then, we must be more attuned to the universe in a gentler manner. Politically, we must have greater control of informationally-intensive tools to which we may all lay claim. The present hardware-intensive machinery now requires specialization to control and it denies us worth. Small-scale technologies, designed appropriately for each region, promote the autonomy of human beings and replace the monopolistic control of large-scale organizations.

Obviously, this new science sets the stage for increasing diversity. It recaptures and reestablishes biological and social diversity by following the natural variability of the microcosms. Biologically, we may find necessary allies in yet unappreciated organisms which act in restoring the planet to a healthy
state. Scientists are just beginning to hypothesize and research this. Technologically countless avenues of small-scale solutions emerge out of humanity's own creativity. An integration of a variety of ecological forms will provide society with sufficient tools for new communities as they are created. Energy needs can be filled as we harness the sun, wind, water, wave, and current in small-scale and nonpolluting alternatives.

The above exposition sounds idealistic and highly nonfeasible if one isn't aware of the New Alchemy Institute founded by John Todd and several colleagues who believe in putting their hands to work after their hearts and heads have provided answers.

Positive changes on behalf of society or the planet will only come about when large numbers of us return to the land, and infused with the wisdom of ecology, build farms, hamlets, and communities, which generate their own power, grow their own foods, and achieve a measure of self-sufficiency.

The goal of the New Alchemy Institute, located originally on Cape Cod but now expanding abroad, is to provide the thinking, biological and physical, that would sustain ecoregions or small groups of people with a fair degree of autonomy, which would allow them not to be subject to manipulation or co-option and allow them to "evolve to greater religious and artistic heights." The name, New Alchemy, itself implies a synergy of nature and humanity working cooperatively. The term, "alchemy," refers to an ancient science of nature that says that the sun, the soil, and human beings, working together, can create a whole that is greater than the separate parts. The New Alchemy Institute is not interested in perfection but in workability and
durability for common persons living in society. Six guidelines provide a basis for the New Alchemy which is geared towards a community’s local needs.

Six Guidelines for the NAI

Research and design at the New Alchemy Institute focuses on the microlevel while maintaining planetary perspectives and a concern for linkages between levels of organization. The micro level includes the "lowest functional units of society," such as the individual or the small group and its sustaining elements. This philosophy is based on the idea that no large unit can be any stronger than the elements comprising it. "Alchemy" refers to this characteristic, as stated by Todd:

"...we link everything with something else. Each time we make a connection, the whole becomes stronger and more stable."

A prime example of these interconnection is the backyard fish farm. The key to setting up fish farms, fed in an aquaculture, is the integration of fish production, insect foods, manure fertilization—an entirely ecological balance between animal and vegetable. One type of fish farm is a simple circular pond, housed under a plastic-covered geodesic dome. Inside this dome, two special of tilapia, a Mid-Eastern vegetarian fish which feeds on algae, thrive in a deep green algae soup. The fish are fed on a cooperative basis, using outside sources of weeds, garden wastes, and dense algae already growing in the pond. Their protein requirement is fulfilled bloodworms, the tiny red larvae of midges, which are also cultivated on
the farm. They are raised on burlap bags which are hung in trenches filled with water that has been fertilized by Milorganite, a sterilized human waste product from Milwaukee. These are merely thrown into the ponds where the tilapia harvest them themselves.

To keep the water free from growth-inhibiting fish wastes, the water is pumped through a filter, composed of Quahog (clam) and oyster shells, which contain the bacteria needed for purification. The water is heated by solar power to an 80 temperature, needed to maintain tilapia. The waste from the fish farm is used in fertilizing certain gardens around the New Alchemy.

These fish farms are not suited to meet large, commercial quantities of fish but can comfortably feed a small group of people. They are grown in an almost-closed ecosystem, using a balance of animal protein and plant culture. This is just one of the lessons that can be learned from the microcosmic world. It is up to us to continue to mirror and magnify it in the macrocosmic structures.

The second guideline stipulates the type of research with which the New Alchemy is concerned. An emphasis is placed on food production and energy systems, which are suitably inexpensive and affordable by a majority which lacks the necessary amount of fiscal resources. By designating that the resultant technology must be inexpensive, the New Alchemy eliminates the "exclusiveness" tendency of most energy suppliers. Indigenous materials that may be found locally are used and researched also.

Whereas the fish farm, multiple greenhouses, and gardens are the routes investigated for food production, solar generators and
windmills are the energy alternatives being developed. The solar
generators heat the water used in the fish farms and also provide
suitable humid conditions for flourishing greenhouses. Big Red, a
26-foot high windmill, pumps water up into solar collectors which
consist of several glass panels mounted over black corrugated alu-
minum. Depending on wind velocity and how fast water drips onto the
aluminum, ten to twenty degrees of heat can be gained.

The third guideline for the NAI is to shift from a "hardware
intensive" society to an informationally and biologically extensive
one.

We believe that in societies organized into micro units, almost all the food, shelter, and internal climates, pow-
er, and even transport can be transformed to biologically and informationally derived support elements. Since it
is more difficult to make a commodity out of living en-
tities like an ecosystem, it seems possible that a future
derived from this basis will be more egalitarian and considerate.

The mission of the NAI is a search for ways to replace the
hardware of the twentieth century technology with a knowledge of
nature which, when linked with gentle and appropriate tools, can
sustain human communities. This facilitates the evolution of a
balanced perspective of our world.

An emphasis is placed on participatory solutions suitable for in-
volving large segments of society. This fourth criteria assumes that
when the petroleum era wanes, a majority of humanity will return to
the task of food-raising. The New Alchemists design methods appro-
priate for food culture on the family level. Large numbers of people
could then comprehend the physical components and maintain them part-
time in their backyards. New Alchemy has shown, for instance, that
production is a shallow 18' diameter dome-covered pond exceeds 50lbs. per crop of tilapia. This would be easily feasible for families or small communities.

The New Alchemists do not isolate their work to one region of the country to the exclusion of the others. The fifth guideline states that research to provide more universality in application shall be done with a bioregional approach to the future. Technology is researched using the indigenous material from the particular area.

Todd elaborates:

In the best of all possible worlds there should be a balance between the regional and the global. Each bioregion should be physically and culturally unique, reflecting a dialogue between society, climate, environment, and resources.

Self-reliance, inexpense, and independence possibly can be regained in regions if indigenous approaches to food production, energy, shelter, and manufacture are given intellectual and scientific consideration.

Exemplary of this is the backyard fish farm, referred to above. It is inexpensive, cost is under $150.00 for construction, highly productive in supplying the meat requirements for around five people as well as vegetable requirements if desired, and versatile in that it can be grown in poor soil in short growing seasons. It requires a small area and produces a diversity of food for nutritional balance and culinary excitement.∗

The final guideline the NAI stipulates is the promotion and

∗These solutions are being experimented with in Costa Rica at another center, spawned by the NAI, and in several areas of maritime Canada.
utilization of renewable energy sources in anticipation of the termination of finite resources presently used. With the inevitable expiration of nonrenewable resources, Todd and his companions chose to investigate and devise systems autonomous from these substances and concentrate on environmentally safe alternatives. This complete their philosophy of gentleness with the Earth and provides decentralized modes of energy production which promote self-reliance on the part of individuals and communities.

A major success for the New Alchemists was the construction in 1976 of an "ark" for the Canadian province of Prince Edward Island. The ark is an autonomous structure powered and heated by the sun and the wind. This single structure contains living quarters for a family, a laboratory, a productive aquaculture system, and a greenhouse. It is architecturally built to house and a variety of basic human activities within ecological limitations. Built with the intentions of providing its occupants with a new economic base of self-sufficiency, it traps, stores, and transforms its own energy, recycles its own wastes and water, and provides a liveable climate for the household, as well as enough food for its dwellers. Such a multipurpose bioshelter has demanded the cooperative efforts of architects, ecologists, and scientists to design.

This is the first attempt on the part of the NAI "to test the feasibility for future living structures which are not continuous energy drains on society."

With that purpose in mind, a special windmill for the Ark was designed with four criteria in mind.
First, the windmill would have to be powerful enough to provide the overall power needs for the Ark or for a large farm. This would promote self-sufficiency from electrical companies and allow the structure to operate and maintain itself.

Secondly, it must be designed with the possibility of scaling up the windmill to a larger size to meet the escalated power needs of Island villages or a power network.*

Thirdly, it must be rugged enough to withstand fierce coastal winds of the Island's intensity along with the deteriorating salt spray.

Next, it was designed to be manufactured regionally on the Island and have a promising future economically. Hopefully, the energy future of the Provinces would be linked to its economy and would provide employment. Perhaps also a structure of this nature would deter the consumption-tendency of society and lead to conserve concepts of positive stewardship of the land.

Through the Ark we are trying to evolve bioshelters which are, in many respects, miniature worlds and will through the tending of them teach their inhabitants how the larger world works. An earth ethic may well have to begin where we live. If this is so, our houses should emulate the workings of nature.

John Todd provides an excellent example of a new age of people who are working for the improvement of the whole based upon a philosophy which brings human beings back into the proper relationship with

*This estimated size was a 25 kilowatt mill size with the possibility of being increased to 100 kws, systems and larger.
the force that gave them birth.

We are beginning to see an emergence of a new synthesis, of a profound intellectual revolution, of a holism that will re-connect knowledge again.... this holism represents a new theory of the nature of nature itself.

The holistic approach can be witnessed by society in concrete physical examples of its workability. John Todd is showing that by putting our hands together, we can develop tools that are scientific proof of the feasibility of holism. It is with this idea that he writes:

If it were possible, and I believe that it is, to design and create semi-contained ecosystems, such as our ark, that trap and store the sun’s heat and sustain biological food webs with food for humans as end products, and to do so without continuing recourse to waning or dangerous energy sources, and if skeletons or frameworks of these ecosystems were made of long-lived materials, then they might prove potent enough biosocial tools to initiate fundamental changes in the societies which adopt them.
FOOTNOTES TO CHAPTER IV


3. Ibid., p. 74.

4. Ibid., p. 67.


7. Ibid., p. 56.

8. Ibid., p. 88.

9. Ibid., p. 56.


12. Ibid., p. 55.


16. Ibid.

17. Ibid., p. 60.


CHAPTER V

REMEDIES

So, then, let us look at a world of speed;
Rushing vessels of intelligence
Charge on to the next
Meaningless destination,
Preoccupied by Saturday-leisure charms.
A blindness exists therein
With schedules and greenbacks
A focus of control.

Let us look at a world of entropy;
All is supposedly organized
But chaos ensues.
We become what we hate
And hate the empty sum
Of so many odd-years
Of fruitless happiness-searches.

Let us look at a world of cosmetics;
Flat smiles are painted
Over the old, tear-smeared lipstick.
Hearts lie bruised
By the forceful slam
Of no-spirit, orgasmless love.

Depth and silence
Are frightening here,
And too time consuming
To be practical.
Male and female
Meet—touch—and separate, recording the
Name-remembrance
In address books.

Nothing but
Machines,
Numb
To the search
And hurt
Near...

sterile chaos....
In the previous chapters I have related three men's insights and suggestions towards an appropriate solution to the numerous problems in today's society. All three are interrelated with many common points. In this final chapter I will combine these practical and philosophical proposals with other insights to produce a holistic, humane remedy for the problem. It is essential that a shift in thought, in attitude, and in action be synthesized to form a balance of head, heart, and hand. Since the symptoms of the problem are integrated and interdependent, so must the solutions be.

It was in the seventeenth century when the Age of Reason fixed humanity's thinking to narrow limits of quantitative measurements. Reason became the acceptable route for the human mind to become intelligent and credible. Only the visible, observable objects in the world that could be empirically proven were considered true. This limited humanity to the physical, calculable world of science with a disregard for the invisible, immeasurable realm of traditional wisdom. The traditional wisdom of humanity considered the human mind capable of transcending itself to gain deeper knowledge.

With a loss, then, of the deep faculties of the mind, humanity remains at the same level of being as the animals who possess life and consciousness but no known chance of self-awareness. The Chain of Being, as it is known, consists of minerals, plants, animals, and humans, each a little more advanced than the previous. By considering only the rational, humanity rid itself of the concept of deeper dimensions and kept itself on a purely physical plane, denying the metaphysical realm.
However, can any person deny the real existence of the invisible realm? To discredit it totally would be to repudiate the existence of emotions, intuitions, and pain. These things need not be taken seriously if such is the case. Yet, no person would reasonably deny the existence of these for each has been experienced. We must delve into a deeper awareness to understand these.

The point of this line of thought is that scientific thinking has stifled our humanness by refusing to acknowledge the spiritual realm and the deeper levels of being. This has resulted in a loss of self-awareness—that which separates us from other beings as far as we know—and stopped the evolution of humanity into deeper realms. At this level, human beings cannot develop into genuine happiness without the pursuit of deeper knowledge. This lays the groundwork for the dissatisfaction and chaos in our unfulfilled culture. Humanity is programmed to participate in society, confining itself to the unsatisfying physical world. As Schumacher says,

Without self-awareness,...man acts, speaks, studies, reacts, mechanically, like a machine; on a basis of 'programs' acquired accidentally, unintentionally, mechanically. He is not aware that he is acting in accordance with programs; it is therefore not difficult to reprogram him—to make him think and do quite different things from those he had thought and done before—provided only the new program does not wake him up. When he is awake, no one can program him; he programs himself.

This programming is exactly what has occurred in modern industrial society. Society trains people to fulfill its needs instead of the inverse in which humanity shapes society to its needs. In this training, humanity suffers by forfeiting its autonomy for industry which
further inhibits the ability to be totally human. The process of becoming human requires the four fields of knowledge, as elaborated upon in the work of E.F. Schumacher, which cannot be obtained from scientific procedures only.

The first field of knowledge directs attention to the inner self which is the pathway to self-awareness. The mechanical control fades here, for no one can legislate the operations of the mind and the heart. This venture into the self involves both the mind and the heart cooperatively. Contemporary persons without self-awareness merely imagine themselves with a free will and the ability to carry out the will. No genuine freedom exists in a person, though, who has not gone within to discover the uncharted territories of the self. In a previous age, religion was responsible (though not always effective) for fostering this inner search for self. Religion was the reconnection (re-legio) of humanity with reality, whether that Reality was called God, Truth, Nirvana, or some other name. Yet few people took advantage of deep searches as set up by religion, except in a monastic setting. They became bogged down by the structures and guidelines and rarely moved beyond them. Since the Age of Reason, humankind has allowed religion to be reasoned out of importance. In so doing, the need of humanity to be awakened within itself assumed a secondary role to economic advancement and logic. Secularism and spiritualism were incompatible opposites with no meeting ground. Western civilization chose not to deal with the metaphysics of life and thus became incapable of dealing with real, ontological questions. Caught up in the doctrine which was a token of spiritualism but rather negligent of the inner self they served the institution, not the spiritual.
The structure dominated the purpose.

It is this violation of the first field of knowledge which has damaged the second field of knowledge, namely, understanding the inner, invisible area in our fellow persons. In order to understand another person's inner life, it is important for one to understand one's own, at least to know of its existence and its importance. To be effective, one must first know one's self so the possibility of empathy or "adequatio" can exist. To take the inner life of a neighbor seriously as one's own is the necessary requirement for the second field of knowledge. To know another and empathize with him or her, one must know and love one's self. Interior journeys have continually suffered at the accusation of social negligence. Seen to be forsaking the world and its material element, they were considered to be balking their social responsibility. Yet the accusation can only be justified if the interior journeyor uses that as an escape—rather than true dedication and realization of the depth within. These individuals, not just the indepth contemplative, need a time of reflection and inner discovery. So few realize this necessity. We lack people in leadership positions who are attuned to others because they are first attuned to the inner field binding them together. How can one expect effective change towards a human order if our leaders themselves have done so so little "inner work" to help them
empathize with others?

These first two fields of knowledge do not involve an intellectual operation of the mind to be effective. An interior search requires a willing heart that delves deeper than the cognitive domain and takes the mind in hand. It is for this reason that rationalists rejected the practice of the "inner work" and religion as cheaply moralizing, outdated and possibly rejected that very force which could have brought them to the truly human level, while also depriving themselves of that which brought them into true communion with their neighbor.

The third and fourth fields of knowledge take on a more objective stance. The third field of knowledge involves knowing one's self as an objective phenomenon, as known and seen by the rest of the world. This requires inner truthfulness and freedom. The systematic study of one's self and other inner worlds must be balanced by critical self-observation which reveals how one is viewed by others. To see the flaws in one's personality as they see them presents another facet of the being one is. It may be a painful realization to discover that this "I am" is not as flawless as the inner self might indicate. Personally, then, to educate myself in this way I must see through the other's viewpoint. To put myself into that viewpoint, I must detach myself from my own situation and see the person they see in me. If I do not involve myself in this search but rely solely on the inner world, I see myself as the center of the Universe without an awareness of others importance. I cannot truly love my neighbor unless I transcend my own ego to discover her.
The fourth field is the most familiar to the scientific world: it is the appearance of the world around us from an objective viewpoint. This field must be balanced by the other three. Faith and love can never be gained in this field alone, but it is necessary in order to help us in our knowledge of the physical world surrounding us.

It is the overemphasis of this final field which has led to the imbalance of humanity's growth in the world. We have become confused in dealing with problems by believing all can be solved by scientific means. These "convergent problems," which can be solved scientifically, are found at the cognitive levels of the mind and can be solved by a converging of ideas. All our economic problems are convergent problems which logically can be solved already. We know how to provide enough and do not require "violent, inhuman, aggressive technology" to do so.

Many problems, however, do not have a single logical answer. Schumacher refers to these:

Man's life can...be seen and understood as a succession of divergent problems which must inevitably be encountered and have to be coped with in some way. They are refractory to mere logic and discursive reason, and constitute, so to speak, a strain-and-stretch apparatus to develop the Whole Man, and that means to develop man's supralogical faculties.

These "divergent problems" cannot be solved with mathematical equations but must be dealt with employing understanding. They require transcendence to remedy them. It is this lack of differentiation which has thwarted humankind in its attempts to alleviate the world's confusion.

It is with this realization that many are willing to admit the answer to the dilemma must come from within, not from without. People
are abandoning materialistic scientism for new lifestyles and "voluntary simplicity." Some of those who are doing this presently, true, are not doing it as a response to spiritual insight, but as a response to an awareness of materialistic crises evident in the environmental crisis. The tendency remains to remedy the problem with a "technological fix." If we only just invest in this technological solution or invent more of this, it is believed, the problem will vanish. This faith in modern man's omnipotence is justifiably dwindling, however. Schumacher comments:

Even if all the 'new problems' were solved by technological fixes, the state of futility, disorder, and corruption would remain. It existed before the present crisis became acute, and it will not go away by itself.

Humanity now realizes the short-sightedness of the "Cartesian revolution," which limits humanity to earth and its inanimate, calculable experiments. Humanity yearns to reestablish its evolution into deeper levels of being and thus satisfy more than the intellectual pursuit of knowledge.

Knowing this, how do we begin the process of healing? It is only by realizing the relationship existing between ourselves, our community, and our environment and regaining the balance therein is a solution possible. What do I mean when I use the term "relationship?" The term "relation," stemming from the Latin word "relatio," means "connection perceived or imagined between things; a certain position or connection of one thing with regard to another." Therefore, we are "connected" to creation with an invisible bond that links us together. This is an age old precept of traditional wisdom. Jesus Christ said, "Love your neighbor
as yourself." This is a crucial element in regaining the balance of the cosmos.

Let us begin with the first field of knowledge, the inner self. When we begin to talk about healing the inner self, an entirely new world opens up: one that is diverse, intensely personal, and one that transcends predictable experimentation. There is not a single formula, no one way of nurturing one's inner awareness and regaining the balance in one's life, and no exclusive avenue to satisfy the persistent thirst each person experiences within. This diversity is advantageous if we can accept it and encourage its profundity. As Tom Bender writes:

True diversity is dependent upon the healthy existence of a non-man-centered world and upon our access to it. The true nature of any experience, situation, lifestyle, culture, or environment can only be gained in interaction with diverse other situations.

When human beings focus on the internal silence and attune themselves to the heartbeat of the whole, they begin to reestablish the intimate relationship with something beyond themselves. Their significance in the world is realized in this relationship and the value is no longer placed on the superficial routes which previously promised satisfaction. These forces on the deeper plane allow humanity to grow beyond itself into a deeper level of being— to increase the intimacy between itself and the pervasive forces of the universe. It is here that transcendence of the moral, divergent problems is possible. The solution comes in that transcendence.

A lesson can be learned from the Eastern cultures who see this inward journey as necessary and invaluable. There is little stigma
about the aesthetic search which is commonly pursued in the East. In the materialized West, however, mystics and prophets are accused of
cultism and labelled heretics. They are written off as irrational, im-
balanced deviants. Yet, here is the key to serenity and wholeness; the
inner awareness which provides strength, conviction, and guidelines
for a full human life. The fragments of life begin to link together
into some orderly sense.

As buzzing frenzy spirals around me,
Jailing me in tubular confinement,
I cry...
   I shout out...
   I ache...
Head whirling.

Control is sought for a silence plateau,
Force against busy force, to end the hurt,
Focused...
   Attentive...
   to the
Within/out force,

That circulates in the veins
Of all creation's membranes,

I lie....
   Silent...
In the womb/tomb
Of this life/death,
Zeroed in on out and
Droning the sensation
Through the pursed contemplative lips,
Not of the hermitic recluse,
Nor the frenzied activist,

But with quiet fervency
And profound respect
For the Spirit,
Manifesting Itself
In the hush.
It is then that we move into the second and third fields of knowledge, that of understanding the inner life of our fellow persons and seeing ourselves as others see us. To appreciate the other's inner life and to know its equal intensity is to truly begin to love the other. This extends past the human realm into all beings created. Harm to them is harm to ourselves for they are related to us. In the human perspective, Schumacher comments:

Although there are constant temptations to forget it, we all know that our lives are made or marred by our relationships with other human beings; no amount of wealth, health, fame, or power can compensate us for our loss if these relationships go wrong. Yet, they all depend on our ability to understand others and their ability to understand us.

Communication is essential in this type of human interchange; communication that is more than just listening to the words and registering the actions. It is a sensitivity to the invisible person in that being that may not be conveyed in outward signs. A "meeting of the minds" is possible only through effort and true empathy. This requires a passing over from one's own inner experience into another's equally personal experience, or, in other words, to see through the eyes of the other. With self-knowledge, a person can transcend the ego to become one with the other if only for a brief time. This does not mean succumbing to the abolition of one's own self but rather a temporary merging of minds. To love one's neighbor as oneself is to love without any interference from one's ego.

This merging is not restrictive only between human beings either. A true test of our openmindedness would be to bridge the gap
between ourselves and other beings in creation. To see all as inter-related is to begin to reawaken ourselves to the binding forces which will, once acknowledged, stimulate balance.

If these passages over into the other's reference were a common practice, actions would be weighed for their impact on human persons and creation before they were enacted. Presently, our society, with its ever increasing stress on economic growth and production, displaces living beings needs. Without appropriate satisfaction, the tension and frustration of unfulfilled people echoes through society in crime and social disease. The problems evident today have been amply discussed in this text to the degree that change is unquestionable. To regrasp the traditional wisdom of the previous cultures, and enrich it with our new view of creation, we can initiate the healing process of society. The alienated person no longer is stranded in isolation but rather sees the close connection existing in all creation.

The question curls through mind's time; What-Where-Who-When-How am I? Am I only— or with some? Repeatedly assaulted In nervous confrontations... To respond—to turn away, Afraid of a nothing end. Again the question dances And I seek destination,... When-Where will it come to me?

And then From a timeless search, The Truth: to identify with all
The very essence
Known not,
Its circumference,
Its scope,
To live anyway.

To grow now with the perpetual plasm,
Binding in a versatile synchrony,
The Beat of the alpha/omega mass;
That force fusing all in a central sphere,
Responding carefully, rhythmically,
To the tiny shifts of each in the whole;
Pro-reacting in positive union
And finding glory in our gift of I...
Our contribution to the sensual
Swirl—-that is yes...that is all...that is we.

Yet, we cannot stop here. The fourth field of knowledge, that
of scientific observation of the world around us, we have already
found abused. It is this detachment from our very environment which
has complicated the problem. We have ignored the relationship ex-
isting between ourselves and our world. For centuries we have under-
stood this relationship to be one of objectivity; we use the earth
and its resources for our own satisfaction. Bound up by economic
growth, competition, and wealth, we have isolated ourselves from
true harmony with our planet. Ivan Illich succinctly states the
problem.

Primitive man sought balance; contemporary man seeks
increased output indefinitely.

These priorities have increased the tension caused by im-
balance and continually does so with each action that further sepa-
rates us from the natural cycle. We continually abuse ourselves,
then, by believing that these “advances” will bring us happiness,
will fill our needs, and will quench our thirst. The spinoff of
this has been a loss of appreciation for our environment.

Our growth mania deters from our real goals, though. Walter Weisskopf in *Human Growth and Well-Being* elaborates:

Too much economic growth tends to destroy the balance between the activist effort and receptivity, doing and being, grasping and receiving, between conscious intentional effort and inner awareness, between reason and feeling. This destructive effect is wrought by excessive individual striving for acquisition as well as by the exclusive emphasis on national economic growth.

It is the objectivity and misplaced values which have to be altered. To remedy this, let us again look Eastward. In Chinese wisdom, humanity is not the focus of all existence. Whereas, in the West, humanity conforms the environment to meet specific human needs, in the East humanity does not channel the natural world to its own ends. Eastern thought regards the relationship between the world and humanity as one of interdependence. One does not tamper with a spirit beyond itself that is part of itself without risking imbalance and possible self-damage. No form of life is more sacred than another. For each nourishes and flourishes through other forms. A balance of life sustaining itself with a give-and-take from all life forms is the way of nature. What results is a supreme respect for all these forms which maintain the life cycle, which complement the existence of other life forms, and which influence human survival in the long run.

It is obvious, therefore, why many cultures hesitate and refuse to take needlessly from the earth for it is that earth with its richness which furnishes them with life-supporting requirements. There is a profound respect for the living organism of the earth, and they seriously
abide by the natural limitations established by nature. This receptivity to creation is not totally foreign to Western culture. Such persons as St. Francis of Assisi and Teilhard de Chardin along with the American Indian cultures saw the interrelationship between humanity and the universe. This awareness, however, is not generally held; and it must be internally held before it can materialize in practices.

Nature then provides the solution of limitation. Seeing our world as related to us, in which our actions influence its reactions and stability, we emerge with a different attitude towards our world. In getting back into relationship with our environment, we begin to see our interdependence and develop a balance with our biosphere by easing the tensions within the entity. We no longer are parasites of the planet, but partners in the stewardship of the land. This new perspective reveals the error in present industrial modes for it regards the land as the servant of itself. Tom Bender writes:

Once we realize that, once we become aware of the whole patterns of energy degradation inherent in different material use, and once we understand the effects of moving into a symbiotic rather than a parasitic relationship with the biological world about us, our present way of doing things will probably seem insupportable.

We place new value on the planet that sustains us and value the preservation of its entity out of genuine respect for interdependency. Using great caution, we analyze solutions with regard to the effect they will have on the ecosystem and our neighbors, who are not detached from us but undefinably part of a whole, as well as on ourselves.
Nature, the god of primitive tribe,
Now reveals another side
That we of set reason fear adopt.

Pull, stretch, strain past restriction,
The colloidal filter of logic,
To break the narrow bubble.

The atoms of earth become our veins,
Part of the matrix, binding
The yearning human heart to its own.

* * * * *

After carefully coming to these conclusions philosophically, we are met with the overwhelming frustration as to how we are to put these into practice. We know that, as Bender says, "Without a deep sense of our purposes, the changes we make are trivial and the places we inhabit without meaning." We know the wisdom in our thought, in our conclusions, in our decisions, yet we know that "out there" in that vast, unfriendly world is a materialistic, technological society filled with a majority of individuals thinking the same way. It would be easy to sink back into frustration after the first barrage of doubt and opposition floods over our optimism. Yet, knowing what is known, we cannot allow ourselves to sink back into dissatisfaction. We know too much.

It is this philosophy of balance with consideration for the natural limits and an awareness of the interrelationships between the world, the society, and ourselves, which paves the way for our actions. The solutions we select must reflect this respect for the "three parties" in the one entity involved. The expanded understanding of relationship
is contradicted in the present styles of living and working. Our actions must verify our conviction in the intercourse. As Tom Bender states:

Bringing our acts into gentler relation with our world brings to us both the satisfaction and peace of knowing we are resting lightly on our world and the freedom of systems and internal problems which arise from large consumption.

We can begin to look at the solutions and actions through a new filter of humanness and respect for the natural creation. If the solutions violate any relationship be it interpersonal or environmental, then they must be altered so as not to further the damage done to the whole.

How does this affect society as it now exists? Obviously, the massive scale of technology defeats the human element as was testified to by all three authors previously considered. Therefore, "technology with a human face," nonthreatening to the biosphere, needs to be designed and constructed. The Heart must see these needs and demands for technology promoting self-reliance and respond to them. This nurtures the creativity of many individuals.

The Heart provides an even greater service. It must remain continually open to the love and sensitivity of all facets of creation. This is the mortar which binds the whole into a balanced unit. It must be responsive to its own uniqueness, its fellow beings, and its environment's. It then becomes the conscience of the society, guiding it through times of imbalance until balance can be achieved. Through the Heart's internalization of this attitude and concern, the crisis can be overcome on a personal as well as societal level.
The philosophy cannot remain in the Head or the Heart exclusively, though. To actualize the thoughts, the Hand must build and use the tools that are scaled to human and natural levels. The implementation of such tools protects the earth from large-scale, concentrated damage to the equilibrium. It is in this area that most work needs to be done to achieve some basis of credibility to the ideas. The Hand must work cooperatively with the Head and Heart to develop feasible alternatives.

This cooperative blend of Head, Heart, and Hand will spawn diverse alternatives to the present modes of technology and will concretely begin the establishment of balance. By utilizing our talents as a people working towards self-reliance and harmony, a change can be affected. Coexistence in a limited sphere can be seen as one of serenity, challenge, and diversity if we are only willing to join our Heads, our Hearts, and our Hands to bring a disturbed society forward into balance.

The heart in its cell is confined to its walls,
Removed by the fact it defies.

The head legislates in the sepulchral din
Insatiable greed, want, and speed.

The hand follows suit; fits its labor to wheels;
Mechanically build and rebuild.

Cerebral reproof for the miracle man
Is solely what's heard and believed.

But
A change from dissection to discovery,
   A balance of head, heart, and hand,
Ameliorating the work of the wise
   Corrects the demands for the land.
It kindles the spark of a vision reborn,
   A cosmos of spirits new found.
It revels in union, attuned to the whole,
   A body responding to each.
FOOTNOTES TO CHAPTER V


2 Ibid., p. 128.

3 Ibid., p. 139.


9 Ibid., p. 6.

10 Ibid., p. 65.
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REVIEWS
