DOCUMENT RESUME

ED 125 859 SE 019 349

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TITLE Sharing Smaller Pies.
PUB DATE Feb 75
NOTE 40p.; Shaded drawings may not reproduce well
AVAILABLE FROM Tom Bender, 760 Vista Avenue, S.E., Salem, Oregon 97302 ($1.50)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Conservation (Environment); Demography; *Depleted Resources; *Economic Change; Energy Conservation; Environmental Influences; *Natural Resources; *Social Change; Technology; *Values

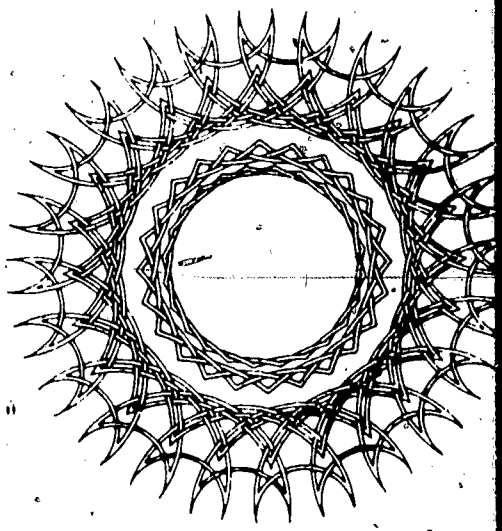
ABSTRACT

This paper details the unfavorable predicament of the United States as a consequence of using much of its own non-renewable material and energy resources. As a consequence, the United States will soon be subject to the political and economic conditions imposed upon it by other nations. The United States must begin to implement adjustments to the new resource realities. Fundamental changes in American institutions are necessary and can offer the quickest, longest lasting, and most effective ways to move to a more viable quality of life. Old problems that the United States has long ignored, such as population, trade, equity, and resources, are discussed. The values, alternative technologies, professional services, and changes necessary to develop a culture that can endure are detailed. A list of additional relevant sources is included. (BT)

Sharing Smaller Pies

Tom Bender

Becoming Slaves to Energy



"There is enough for everyone's needs,
but never enough for anyone's greeds."

There is no longer any doubt that our age of affluence based upon depletion of our planet's non-renewable energy and material resources is at an end and that MAJOR changes must be made in every aspect of our lives. We have allowed our populations to rise above what can be sustained without massive injections of rapidly depleting fossil fuel energy. Our country, in particular, has used up much of its own non-renewable material and energy resources and has come to depend upon consumption of the resources of other countries at a prodigious rate. Americans currently consume more than a third of the entire world's production of oil, and must import nearly 100% of many "essential" materials. Such patterns and levels of resource use cannot be continued either physically or politically, as other countries require more of their own resources and realize the absurdity of allowing us to consume their irreplaceable source of wealth merely to support an unnecessarily wasteful way of life.

Plentiful resources have given us wealth in more than a metaphorical sense. We have prided ourselves on our affluence, believing that it has been brought about because of our hard work and ingenuity. In reality, those attributes occur in every society, and our wealth is almost entirely based upon our intensive use of energy and material resources.

Beneath all the hocus-pocus of our monetary system, our true wealth is the quality of life available to us in return for our work. Our recent affluence has been possible because of the great amounts of work done for us by fossil fuels, which until recently have required very little of our actual work to obtain. For one unit of our work we have been able to obtain 50 units of work done for us by fossil fuels. We have been using approximately 10 percent of our work to obtain such energy, which means that fossil fuels have had the effect of temporarily increasing our total ability to do work by almost six times.

The low cost to us of energy-work has also made possible our massive exploitation of the work of people without "energy-slaves". They have had to compete with their own work against the cheap work of our fossil fuels, thus lowering the return for their work to the pittance we have had to pay for fossil fuels to do equal work. It is this ability to do work, the power it has given us to exploit the work of others, and our rapid consumption of material resources on a global basis that has temporarily given us much greater wealth than other societies.

These energy and material resources that have supported our wealth are being rapidly exhausted on a global basis, and the remaining reserves are requiring increasing amounts of our work to obtain. We have assumed that these lower grade energy reserves would become economically developable as richer, lower cost sources were exhausted. We have ignored, however, that our ability to afford any significant use of such expensive energy sources is dependent upon our wealth generated from inexpensive energy sources, and as inexpensive reserves are exhausted, we will become increasingly less able to afford more expensive ones.

Global population is still increasing beyond what can be sustained and is making greater demands for those increasingly limited resources. At the same time, political actions are being taken to slow the rate of depletion of these resources and to assure longer benefit from their use, decreasing further their current availability. These events make our continued dependence upon these vanishing resources impossible, and require that we move to the use of renewable resources such as solar energy, agriculture, and human work, and to the lower levels of activity they can support.

This is a fundamental and permanent change in our condition that even our wildest dreams of fusion power and unlimited energy cannot alter. Even if such dreams would prove technically possible, they would only move the timetable back a few years until we have to meet the same unrealities of infinite growth in a finite world with a larger population and closer to the absolute limits of our planet. We must face the realities that any attempts to sustain our growth, or even to maintain our style of life without basic changes will result in a steady, if not catastrophic, worsening of our quality of life.

YOU CAN'T COMPETE WITH UNCLE OIL

Events are already underway which will in a very few years transform the United States from one of the richest and most powerful nations on earth into one of the weakest and most dependent -- unless fundamental changes are made in our economic and social processes.

Economic and political independence and health cannot be maintained when we are dependent upon other people for the energy and resources to operate our society. We are wastefully exhausting our domestic energy and material resources and are attempting to embark on a more concentrated attempt to rapidly exhaust them in the name of "Independence". At the same time, we have built up a structure of cities, agricultural and industrial production, education, and professional services that require the importation of massive amounts of energy and materials to operate.

Rapid exhaustion of our domestic resources will make us totally dependent upon the resources of other nations -- available only on their political and economic conditions, if available at all. Even if those nations were willing to supply us with energy and materials, we would not be able either to afford them or to remain competitive with them because of our overcomplex and expensive industrial and agricultural processes, institutions, and physical structure. And even if we are able to convert our country to operation under its income energy and stock of available materials and thus become independent of direct foreign power, the availability of low cost energy and material resources in other countries means that they will have the same absolute advantage over us in economic trade that we have enjoyed over other countries in the last century. We have incontrovertibly proven that goods produced without inexpensive energy sources cannot compete with those that are, and that such a contest spells economic and cultural ruin and exploitation for countries that try. Now we will be on the bad end of that relationship unless we can establish the controls on trade that we have prevented other countries from establishing when we had the power surplus.

CHANGING POSSIBILITIES

Plentiful resources have until recently freed us from having to judge -- from the need for the wisdom or ethical strength to say, "This will not be good for us". Having the ability to mask the symptoms and effects of unwise actions, to rebuild structure cheaply, and to introduce exotic sources of materials and energy, has permitted us to try anything that held the promise of immediate benefit -- or just be possible -- regardless of its eventual cost or damage. This has had a positive aspect, for it has given us an opportunity to test our ethical and moral wisdom -- no holds barred -- and through our mistakes to come to a deeper and more fundamental basis for the choices we learn to be right.

It has allowed us to explore new kinds of technologies, social and political organization, and assumptions about our world. From testing our past assumptions, and through being able

to repeat all the evolutionary dead ends that nature has already abandoned, we have the opportunity to come to a closer understanding of the real possibilities and limitations of our world. Such understanding can give us greater and more precisely defined freedom and more thorough and precise understanding of what we can and should do and not do. The closer we can move our arbitrary human laws to the realities of natural law, the less arbitrary and more meaningful they become, and less is required to enforce and sustain them. Within natural law is total freedom, for it defines the realities through which we must move.

Such a period of testing is always limited, and is coming to an end today as the inexpensive energy to support such experimentation is becoming less available, and as the externalized and deferred costs of the ways we have experimented with are becoming visible and unaffordable at increasingly rapid rates. This is forcing us as individuals and as a society to develop and choose values, to develop ways of living, working, relating, and feeling which offer greatest benefit to our survival and well-being, and to develop the moral discipline to sustain such ways.

Value judgements seem ephemeral when considered beside profit and loss statements, yet profit and loss statements hold little meaning when viewed from the next generation, or when viewed beside the loss of the irreplaceable physical realities upon which the continuing support of our lives must depend. Values are really a complex and compact depository of survival wisdom -- expressions of those feelings, attitudes, actions, and relationships we have found to be most essential and supportive of our continuing well being within certain ranges of physical realities. Those values become touchstones from which we determine ways of dealing with specific situations. Under conditions when growth and great wealth is possible, our values and the actions arising out of them shift to take best advantage of that possibility. When material growth is no longer possible or desirable, our values and actions must again adjust to harmonize with those new realities.

Our present assumptions reflect conditions of plenty and promises of continued and even greater plenty. Inexpensive energy has been available to multiply the effect of our work and make our dreams more easily achieveable. Natural resources have been plentiful and easily obtained. Our population has been relatively small in comparison to these resources, and human resources thus in relatively short supply.

We have believed that human work could and should be replaced by machines, and that such changes would contribute to our well being. We have considered that enlargement of our material wealth offered the primary if not sole means to improve

our quality of life -- to the point of equating measurement of our material productive capabilities with quality of life.

The novelty and excitement of our new abilities to materially change the conditions of our lives through massive use of resources has made evaluation of such actions difficult. Inexperience with the effects of such profoundly different technologies has until recently made such evaluation impossible and reasonable control unattainable.

We have shown little concern about the economic and social effects of our actions upon each other and even less upon people of other cultures. We assumed that such problems would be resolved through greater production of goods and services, or were unimportant because of our relatively great material wealth and assumed equity of opportunity for everyone. We also have had great confidence that the apparently powerful tools of our sciences and technology could apply and have as positive an effect on other aspects of our lives as they have on our material well-being. We have felt that we could beneficially institutionalize our individual responsibilities for caring for ourselves and others, for seeing to our health, education, and safety, and for seeing to the effects of our actions.

Such assumptions have proven wrong.

We have plunged headlong for more than half a century into development of a technological direction unprecedented on this planet, and are now finding that its direction is unsustainable, its effects undesirable, and its replacement necessary if we are to ensure the soundness, stability, and permanence of our society, our individual freedom and opportunity for personal growth, and the overall health and well-being of our society.

FREEDOM IS ALWAYS POSSIBLE

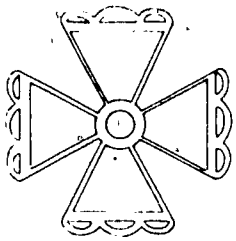
New assumptions about what we are and what we wish to accomplish are needed. New perceptions on how our institutions actually operate, how they need to operate under our new conditions, and what changes need to be made must be established, and the steps that must be taken to adjust our values and institutions to what will be required of them must be laid out so we can begin changes. The critical actions that must be taken are few, and it is inherent in their nature that they must be made on local or regional levels, though timely action on a national or international level could speed and assist the changes.

Our dependence on massive resource use has been so total that most Americans cannot conceive of operating on as little as one third the energy we use -- though quite civilized countries such as New Zealand, Switzerland, Japan, and France do so quite well. It remains totally uncomprehensible to us that a society can operate adequately on ten, five, or even one percent of the energy and wealth that we demand, yet hundreds of millions of people do so and have always done so. Ironically, our ineffective use of energy, the improvident ends to which we have used it, and the increasing inefficiency of our institutions has resulted in our quality of life actually becoming in many ways lower than that of other nations consuming only a fraction of the energy we do, and having, by our standards, considerably less wealth. Our health standards, the quality of our surroundings, the use of our time, the efficiency of our industry have all fallen below that of many other countries.

We know that good and viable societies can exist with much less bountiful resources and wealth than our own, and have considerable precedent and experience to examine and build upon in development of more sound organization and direction for our society. The experience of traditional societies, of the current development directions that several "underdeveloped" countries such as China and Tanzania have chosen, and the experience of sectors of our own society that have already chosen to change their lifestyle and avoid the rush later can all contribute both directions and cautions for our own forthcoming changes.

Any affluence that we can now maintain or achieve must come about through prudent and frugal use and conservation of our resources. It requires the development of new production processes as well as educational, governmental, professional, and other institutions that can operate successfully on the scale and the resources possible, can conserve and sustain our irreplaceable resources, and can generate rather than consume resources and wealth. And most importantly, it requires the development of sufficient self-discipline to limit our numbers and our demands in order to maintain our way of life above the subsistence level to which it must otherwise sink.

FUNDAMENTAL CHANGES IN OUR INSTITUTIONS ARE NECESSARY -- RESOURCE CRISIS OR NOT -- AND CAN OFFER US THE QUICKEST, LONGEST LASTING, AND MOST EFFECTIVE WAYS TO MOVE TO A BETTER QUALITY OF LIFE WHILE ADJUSTING TO THE NEW RESOURCE AND ECONOMIC CONDITIONS WITH WHICH WE ARE FACED.



Harmful Servants

Ever since its founding, the resources of our American society have appeared so plentiful that no reason seemed justified for restraint in their use, for concern about what would happen when they were exhausted, or consideration of the pervasive effects of plentiful and inexpensive resources on seemingly remote and unrelated aspects of our society. The effects of abundant resources upon the nature and operation of our institutions are both all-pervasive and invisible because they have always been there. Our institutions have all been formed under conditions of plenty -- which accounts for their success under those conditions -- and have never before faced even serious prospect of operation under scarcity.

EVERY INSTITUTION IN OUR SOCIETY IS ORGANIZED TO ENCOURAGE AND FURTHER GROWTH, AND EVERY INSTITUTION HAS DEVELOPED PATTERNS OF ORGANIZATION AND OPERATION THAT REQUIRE UNAFFORDABLE QUANTITIES OF OUR RESOURCES AND WEALTH. Our tax laws stimulate growth of corporations at the expense of individuals. Our monetary regulations force growth. Our legal system permits the instability of contractural relationships. Our constitution ensures rights, but ignores concommittant responsibilities. Our government ignores responsibilities for sustaining our biosystems. Our schools teach consumption and our cities demand it. We permit public communications media to be conduits for private advertisement for furthering consumption.

We only consume, and do not produce, while learning. Our building codes require structural strength, electrical capacity, thermal control, and lighting levels that are totally unnecessary. Our land use patterns demand ever-increasing costs of transportation. Our dietary consumption of sugar demands ever-increasing dental services. Sugar is shipped from Hawaii to New York, placed in paper wrappers, and sent back to Hawaii. Trucks carrying widgets from New York to Los Angeles pass trucks carrying the same widgets from Los Angeles to New York. Agriculture consumes energy instead of producing it. It is all unsustainable.

With fossil fuels doing almost all of our work, the effect of inefficiency in our own work and our institutions has been relatively unnoticeable. The value of, and respect for, human work and skills is relatively small when energy slaves will do our work for only two percent of the cost of the human work. As remaining fossil fuels require more work to obtain, the relative value of human work increases. As material costs increase, so does the value of our immaterial resources, and the effectiveness of all our institutions and processes becomes more and more important.

If energy wealth has made the inefficiency of our institutions temporarily unimportant, our measurement of our quality of life, the effectiveness of our production, and the progress of our society through the single measure of "Gross National Product" has given such inefficiencies the appearance of improving our lives. The more we must spend for transportation, for education, or for medical services; the farther we must go for oil, wood, and food; the more our GNP grows, and the more it appears that our quality of life is improved. This focus on production has effectively ignored the reality that most production and consumption is actually the COST of replacing and maintaining our stocks of goods and services rather than a measure of our wealth. Even now less than 10 percent of our production goes for increasing the stocks of goods and services available to us -- the other 90 percent goes for maintaining and replacing our existing ones.

It seems strange at first to say that a smaller GNP, or less expenditure for transportation or medical costs could improve our quality of life. Yet we recognize that any time we can eliminate a need for transportation we have to spend less of our time, work, and income to pay for it, and whenever we can maintain the same quality of medical service on a smaller budget, we increase our options on how we can spend the time or income that otherwise would go to supporting those services. Satisfying our needs with the least expenditure of time, energy, and dollars is only good common sense.

Efforts have been made to determine the timetable for the end of our affluence and the degree of reduction in our energy and wealth to which we must adjust. Such efforts are largely impossible, because factors such as political decisions, the amounts of energy reserves that further prospecting will discover, technological developments in using renewable energy sources, changing rates of population growth, and possibilities of economic collapse as complexly interconnected systems wind down are all crucial and unknowable in advance. Exact timetables and levels are also relatively unimportant, because the directionality of events is what is important, and that is fundamentally unchangeable. We know that the minimum rate for changing things is the replacement rate for present equipment and the rate necessary to maintain employment. Any faster changes will be to our ongoing advantage. Most of the changes we must make are beneficial to our quality of life whether or not reduction in our wealth makes them unavoidable at any particular time. Most of the changes are also cumulative in effect -- the sooner we are able to implement them, the greater both the short and long run benefits. We only need to know that in 10 or 15 years -- 20 years at the most, we will be living in a world extremely different from today, and one that will be extraordinarily difficult for us if we have not exerted our fullest efforts in the interim to prepare for it.

We have been told countless times that growth is necessary to the health and well-being of our economy and our society. That assumption is even truer than imagined. If we stop growing and consuming, our whole system WILL come apart. However, it is also absolutely unavoidable that we WILL stop growing, and that we WILL have to consume less. The collapse, or at least total change, of our system is unavoidable, but necessary. It is inherently unsustainable, and as such must be changed as the resources to support growth and high levels of resource use become unavailable. Fundamental change is required in our every action and in every value that underlies those actions.

We have never paused to critically examine the nature and effects of our institutions and impose ethical and moral-based restraint on those that lessen the quality of our life, restrict our competence and creativity, or which have negative effect on society as a whole. Many of our institutions are based on such wrong assumptions that they actually impair the basic things they are supposed to achieve. Our transportation system, for example, is often claimed to be the finest in the world, yet proves on analysis to be less effective than societies where people walk everywhere they go:

> "The typical Americans devote more than 1,600 hours a year to their car. They sit in it while it goes and while it stands idling. They park it and search for it. They earn the money to put down on it and to meet the monthly installments. They work to pay for petrol, tolls, insurance, taxes, and tickets. They spend four of their sixteen waking hours on the road or gathering their resources for it. And this figure does not take into account the time consumed by other activities dictated by transport: time spent in hospitals, traffic courts, and garages; time spent watching automobile commercials or attending consumer education meetings to improve the quality of the next buy. The model American puts in 1,600 hours to go 7,500 miles; less than five miles per hour. In countries deprived of a transporation industry, people manage to do the same, walking wherever they want to go, and they allocate only three to eight percent of their society's energy and monetary budget to traffic instead of 28 percent. What distinguishes the traffic in 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."
>
> ENERGY AND EQUITY, Ivan Illich

Our institutions have become counterproductive -- producing less health, less transportation, less learning, less justice -- while consuming more energy, dollars, and time. Education is required that is never used. Research is done for marketing rather than product improvement. More money is spent processing bills than the amount of the bills. More money is spent administering welfare than is received by the poor. Freeways use so much land that places are farther apart and require more freeways to get to. Air conditioning makes cities hotter, necessitating more air conditioning.

The counterproductive nature of our institutions has arisen from a mistaken belief, or hope, that individual responsibility -- within an institution, in supporting, regulating, and using such institutions, and in avoiding dependence upon them -- could be replaced without harm by organization, regulation, and equipment.

It remains the responsibility of people within an institution to use it as a means of heightening their ability to serve, not as an excuse to not serve. Responsibility for being aware of the effects of our actions from the receiving end -- what it is like to apply for a job or unemployment, to be sick, to be in a hospital, to need aid -- cannot be replaced by regulations. Responsibility to perceive mis-direction of institutions and the power to correct it cannot be replaced by the most sophisticated computer. Responsibility to gain the respect and support from those served cannot be replaced by any program organization. Only individual responsibility can maintain health instead of restoring it. Only individual responsibility can result in caring rather than care, and marshall the true resources needed for healing. Only individual responsibility can ensure that we learn rather than are educated.

Medicine, architecture, law, education, transportation, social work, and civil engineering have all followed the path of increasingly professionalized, more restricted, and less beneficial application of their skills. Our reaction to their increasing damage and failure to achieve their purpose has been to escalate their technological, bureaucratic, and energetic growth. Such fundamentally wrong assumptions can be countered only by deprofessionalizing the social agencies, setting limits to their operation, and reassuming individual responsibility for their purposes.

The spiraling costs of repairing institutional-caused damage quickly becomes unaffordable even for societies with vast resources. As resources become depleted on a global scale, such practices will be totally unaffordable and cause institutional crises and collapse. The wisest and least costly way to maintain health and learning, control population and obtain goods must be based on personal rather than institutional responsibility for actions. When people are prevented from having viable options

in satisfying their needs, institutions concerned with delivery of any service or goods are effectively insulated from evaluation and testing of both the validity of the assumptions involved and the effectiveness of the processes used.

When we have already been required to pay for social security, public schools, or our highway system; when tax advantages for large corporation prevent viable competition from small businesses; when union regulations, building codes, and drug prescription laws prevent alternatives, we can rarely either afford or obtain alternative means of satisfying our needs, and our consumption of existing goods or services is, for all practical purposes, compulsory.

OLD PROBLEMS

In determining our new directions, we must face and resolve a number of problems we have long been able to ignore.

Per capita wealth, and indeed, survival, is almost totally tied to population size. With fixed or decreasing resources, population control is absolutely necessary if our quality of life is not to drop to a subsistence level. The only humane way to control population and poverty without repressive central control is to restore to people the responsibility and control of their lives and their world, so they directly understand and are affected by their ability and that of society to support more or fewer children. This requires an absolute reversal of our present trend towards institutionalization of our responsibilities and broadening institutional control over our lives.

Trade and other economic and social relationships with other regions and nations must be controlled to prevent our exploitation and loss of independence. "Free" trade is only possible among equals -- the work of our people cannot compete with the work of fossil fuels of other nations. Trade among unequals is exploitive, as we have long known to our benefit. Our resource depletion will leave us in a dependent and exploited trade relationship unless we are aware of the meaning of our changing resource realities and ensure that our trade relationships are correspondingly regulated. Control of relationships is necessary to maintain independence and viability, buffer internal commerce against massive external disruptions, and prevent the exploitation of the work and livlihood of our people. Unrestrained trade also makes control of political and economic systems less possible and makes control of exploitation of ecosystems virtually impossible. Localization of economic activity is necessary to reduce costs, regain control of productive systems, and make more effective use of our resources as well as to maintain independence and freedom. Dependence on trade results in loss of independence.

Problems such as equity must now be resolved. We have been able to avoid them through the assumption that increasing wealth would soon solve everyone's problems -- that there would be a bigger pie to share and that everyone's absolute share would increase. That is no longer possible, and arguments for inequality in wealth as necessary for investment and growth have lost their force. It is hard to see how ethical appeals for equal shares can any longer be countered. Achieving equity will require not only redistribution of wealth but also redistribution of the means for producing wealth.

We must reduce our wants closer to our needs, which are but a small fraction of our current demands -- and become more aware of what is possible. Unless we can determine more accurately what is possible at any time, and adjust our dreams and demands to that reality, increased frustration, damaging economic policy, and problems of civic unrest and distruption can become overwhelming.

Fewer resources, coupled with more work and dollars necessary to get those remaining resources leaves substantially less to operate the rest of our society. All institutions must soon be able to operate on a small fraction of the energy and dollars that have been available to them. Conservation -- more efficient use of energy and dollars in existing systems -- can afford some relief. Reduction in resource use on the order of 40% is both necessary and possible through conservation. Without fundamental changes in our institutions, conservation alone is more likely to restrict than improve our quality of life in the process.

We have reached the point where the economics and logistics of improvement of our life quality through physical and institutional means have become less beneficial than through new values and expanding individual responsibility and initiative.

New Values

Our ability to develop a culture that can endure beyond our own lifetimes depends upon our coming to a new understanding of what is desirable for a harmonious and sustainable relationship with the systems that support our lives.

STEWARDSHIP, not progress.

We have valued progress highly during our period of growth, as we have known that changes were unavoidable, and have needed an orientation that could help us adjust to and assist those

changes. Progress assumes that the future will be better -- which at the same time creates dissatisfaction with the present and tells us that NOW isn't as good. As a result, we are prompted to work harder to get what the future can offer, but lose our ability to enjoy what we now have. We also lose a sense that we ourselves, and what we have and do, are really good. We expect the rewards from what we do to come in the future rather than from the doing of it, and then become frustrated when most of those dreams cannot be attained. The "future" always continues to lie in the future. Progress is really a euphemism for always believing that what we value and seek today is better than what we valued before or what anyone else has ever sought or valued.

Stewardship, in contrast to progress, elicits attentive care and concern for the present -- for understanding its nature and for best developing, nurturing, and protecting its possibilities. Such actions unavoidably insure the best possible future as a byproduct of enjoyment and satisfaction from the present.

The government of a society has a fundamental responsibility, which we have neglected, for stewardship -- particularly for the biophysical systems that support our society. It is the only organ of society which can protect those systems and protect future citizens of the society from loss of their needed resources through the profiteering of present citizens. The government's fundamental obligation in this area is to prevent deterioration in the support capacities of the biophysical systems, maintain in stable and sound fashion their ongoing capabilities, and whenever possible extend those capabilities in terms of quality as well as quantity. Present and past governments, and those who have profited from their actions, must be accountable for loss to present and future citizens and to the biophysical systems themselves from their actions.

AUSTERITY, not affluence.

Austerity is a principle which does not exclude all enjoyments, only those which are distracting from or destructive of personal relatedness. It is part of a more embracing virtue -- friendship or joyfulness, and arises from an awareness that things or tools can destroy rather than enhance grace and joyfulness in personal relations. Affluence, in contrast, does not discriminate between what is wise and useful and what is merely possible. Affluence demands impossible endless growth, both because those things necessary for good relations are foregone for unnecessary things, and because many of those unnecessary things act to damage or destroy the good relations that we desire.

PERMANENCE, not profit.

Profit, as a criteria of performance, must be replaced by permanence in a world where irreplaceable resources are in scarce supply, for profit always indicates their immediate use, destroying any ability of a society to sustain itself. The only way to place lighter demands on material resources is to place heavier demands on moral resources. Permanence as a judge of the desirability of actions requires first that those actions contribute to rather than lessen the continuing quality of the society. Permanence in no way excludes fair reward for one's work -- but distinguishes the profit a person gains based on loss to others from profit derived from a person's work or contribution to others.

RESPONSIBILITIES, not rights.

A society -- or any relationship -- based on rights rather than responsibilities is possible only when the actions involved are insignificant enought to not affect others. Our present society is based upon rights rather than responsibilities, and upon competitive distrust and contractural relationships rather than upon the more complex and cooperative kinds of relationships common in other cultures. These relationships have given us the freedom to very quickly extract and use our material wealth, settle a continent, and develop the structure of cities and civilization.

Any enduring relationship, however, must balance rights with responsibilities to prevent destruction of weaker or less agressive, yet essential, parts of relationships -- whether other people, the biosphere that supports our lives, or the various parts of our own personalities.

Distrust or contractural relationships are the easiest to escape and the most expensive to maintain -- requiring the development of elaborate and expensive legal and financial systems -- and cannot be the dominant form of relationship in societies that do not have the surplus wealth to afford them. Moral or ethically-based relationships; relationships based on cooperation, trust, and love; and the relationships encompassing more than just work, family, educational, recreational, or spiritual parts of our lives are more rewarding and satisfying to the people involved. They are also more stable in their contribution to society, vastly easier to maintain, and harder to disrupt. They have always been the most common kinds of relationships between people except under the extreme duress of war or growth.

PEOPLE, not professions.

Our wealth has made it possible for us to institutionalize and professionalize many of our individual responsibilities -- a process which is inherently ineffective and more costly, which

has proven destructive of individual competence and confidence, and which is affordable only when significant surplus of wealth is available.

We have been able to afford going to expensively trained doctors for every small health problem, rather than learning rudiments of medical skills or taking care to prevent health problems. We have been able to afford expensive police protection rather than handling our problems by ourselves or with our neighbors. We have established professional social workers, lawyers, and educators -- and required that everyone use their services even for things we could do ourselves and that are wastes of the time and expertise of the professionals. As the wealth that has permitted this becomes less available to us, it will become necessary to deprofessionalize and deinstitutionalize many of these services and again take primary responsibility for them ourselves.

Our institutions have contributed to isolating, buffering, and protecting us from the events of our world. This has on one hand made our lives easier and more secure, and freed us from the continual testing that is part of the dynamic interaction in any natural system. It has also, by these very actions, made us feel isolated, alienated, and rightfully fearful of not being able to meet those continued tests without the aid of our cultural and technical implements.

Our lack of familiarity with all the natural processes of our world and uncertainty of our ability to successfully interact with them aided only by our own intuitive wisdom and skills has enslaved us to those implements and degraded us. We can act confidently and with intuitive rightness only when we aren't afraid. We can open ourselves to the living interaction that makes our lives rewarding only when we cease to fear what we can't affect. Fear is only unsureness of our own abilities.

We have to take responsibility OURSELVES for our own lives, actions, health, and learning. We must also take responsibility ourselves for our community and society. There is no other way to operate any aspect of our lives and society without creating dictatorial power that destroys and prevents the unfolding of human nature and that concentrates the ability to make errors without corrective input. No one else shares our perceptions and perspective on what is occuring and its rightness, wrongness, or alternatives. We are the only ones who can give that perspective to the process of determining and directing the pattern of events.

Our institutions can be tools that serve us only when they arise from and sustain the abilities of individuals and remain controlled by them.

BETTERMENT, not biggerment.

Quantitative things, because of the ease of their measurement by external means, have been sought and relied upon as measures of success by our institutionally-centered society. We are learning the hard lesson that quantity is no substitute for quality in our lives, that qualitative benefits cannot be externalized, and that a society that wishes betterness rather than moreness, and betterment rather than biggerment, must be organized to allow individuals the scope for determining and obtaining what they themselves consider better.

ENOUGHNESS, not moreness.

We are learning that too much of a good thing is not a good thing, and that we would often be wiser to determine what is enough rather than how much is possible. When we can learn to be satisfied with the least necessary for happiness, we can lighten our demands on ourselves, on others, and on our surroundings, and make new things possible with what we have released from our covetousness. Our consumption ethic has prevented our thinking about enoughness, in part out of fear of unemployment problems arising from reducing our demands. Employment problems are only a result of choices of energy vs. employment-intensive production processes and arbitrary choices we have made in the patterns of distributing the wealth of our society -- both of which can be modified with little fundamental difficulty. Our major goal is to be happy with the least effort -- with the least production of goods and services necessary and with the greatest opportunity to employ our time and skills for good rather than for survival. The fewer our wants, the greater our freedom from having to serve them.

LOCALIZATION, not centralization.

Centralization, in all kinds of organization, is important during periods of growth when ability to quickly marshall resources and change and direct an organization is important. It is, however, an expensive and ineffective means for dealing with ongoing operations when an excess of energy to operate the system is unavailable. As effectiveness in resolving problems on the scale and location where they occur becomes more important, organization must move to more localized and less institutionalized ways of operation. Even with sufficient resources, the power concentration of centralized systems overpowers the rights of individuals, and has proved to lead to inevitable deterioration of our quality of life.

The size and centralization of many of our organizations has nothing to do with even alleged economics or benefits of scale, and actually often is associated with diseconomics of scale and deterioration of quality of services. Size breeds size, even where it is counterproductive. It is easiest for any organization to deal with others of the same scale and kind of organization,

and to create pressures for other organizations to adapt their own mode of operation.

EQUITIZATION, not urbanization.

Uncontrollable urbanization has accompanied industrialization in every country where it has occurred. The roots of that urbanization, which has occurred in spite of the desires of both the people and the governments involved, has been twofold: the destruction of traditional means of livelihood by energy slaves and the market control of large corporations, and the unequal availability of employment opportunities and educational, medical, and other services. Neither of these conditions are necessary. The inequity of services has resulted from conscious choices to centralize and professionalize services rather than to manage available resources in a way to ensure equal availability of services in rural as well as urban areas. The destruction of traditional patterns of livlihood has been equally based on conscious and unnecessary choices.

Equity is not only possible, but is necessary to restore choices of where and how one lives. It is necessary to restore alternatives to our unaffordably costly urban systems. It can be achieved through introduction of appropriate technology; through control of organization size; by equalizing income and available wealth; by establishing equal access to learning opportunities, health care, justice, and other services; and by assuring everyone the opportunity for meaningful work. It can be achieved by returning to individuals the responsibility and control of their lives, surroundings, and social, economic, and political systems; by ensuring freedom to not consume or depend upon any systems other than one's own abilities; and by encouraging the ownership of the tools of production by the people who do the work, thus increasing the chances of developing a balanced, affluent, and stable society.

WORK, not leisure.

We have considered work to be a negative thing -- that the sole function of work was to produce goods and services. To workers it has meant a loss of leisure, something to be minimized while still maintaining income. To the employer it is simply a cost of production, also to be minimized. Yet work is one of our greatest opportunities to contribute to the well-being of ourselves and our community -- opportunity to utilize and develop our skills and abilities, opportunity to overcome our self-centeredness through joining with other people in common tasks, as well as opportunity to produce the goods and services needed for a dignified existence. Properly appreciated, work stands in the same relation to the higher faculties as food to the physical body. It nourishes and enlivens us and urges us to produce the best of which we are capable. It furnishes a medium through which to

display our scale of values and develop our personality. To strive for leisure rather than work denies that work and leisure are complementary parts of the same living process, and cannot be separated without destroying the joy of work and the bliss of leisure.

From this viewpoint work is something essential to our well being -- something that can and ought to be meaningful, the organization of which in ways which are boring, stultifying or nerve-wracking is criminal. Opportunity for meaningful work rather than merely a share of the products of work, needs to be assured to every member of our society.

TOOLS, not machines.

We need to regain the ability to distinguish between technologies which aid and those which destroy our ability to seek the ends we wish. We need to discriminate between what are tools and what are machines. The choice of tools and what they do is at root both philosophical and spiritual. Every technology has its own nature and its own effect upon the world around it. Each arises from, and supports a particular view of our world.

A tool channels work and experiences through our faculties, allowing us to bring to bear upon them the full play of our nature -- to learn from the work and to infuse it with our purposes and our dreams -- and to give the fullest possible opportunity for our physical and mental faculties to experience, experiment and grow. A tool focuses work so that our energy and attention can be fully employed to our chosen purposes.

Our culture has valued devices that are labor saving and require little skill to operate. By those very measures, such devices are machines which rob us of our opportunity to act, experience and grow, and to fill our surroundings with the measure of our growth. We need skill-developing rather than labor-saving technologies.

INDEPENDENCE AND INTERDEPENDENCE

Many of the basic values upon which we have tried to build our society have become weakened through the ways they have been interpreted and face the prospect of further weakening through the pressures inevitable in adapting our society to new conditions.

Independence cannot be maintained when we are dependent upon other people or other nations -- as long as we are forced to work on other's terms, to consume certain kinds of education to qualify for work, to use automobiles because that kind of transportation system has made even walking dangerous or physically impossible;

as long as we are dependent upon fossil fuels to operate our society; as long as we must depend upon resources other than ourselves and the renewable resources of our surroundings, we cannot be independent.

We have also discovered through the power that our wealth has given us that slavery is as enslaving for the master as for the mastered -- by becoming DEPENDENT upon the abilities of the slave, whether the slave is a human, animal, institututional or energy slave, we forego developing our own capabilities to be self-sufficient.

In another sense total indepedence is never possible, for that means total power, which inevitably collides with the wants and power of others. We are also, in reality, dependent upon the natural systems that convert the sun's energy into the food upon which we live. Totally independent individuals may have freedom from organization, but have no special value, no special mission, no special contribution and no necessary role in the energy flows and relationshops of a society that permits greater things than are attainable as individuals. Such freedom results in little respect or value for the individual. Our success and survival on this planet also must recognize the total interdependence that exists between us and the health, disease, wealth, happiness, anger, and frustrations of the others with whom we share this planet.

Two things are important. We must have the CAPABILITY for self-sufficiency -- in order to have options, alternatives, self-confidence, and knowledge of how things are related and work and to be able to lighten our demands on others. We must also have the ABILITY to contribute our special skills to the development of interdependent relationships which can behefit all. Trade, as giving of surplus, of what is not necessary, is the only viable resolution of the interrelated problems of independence, interdependence, and slavery.

As we begin to actually make changes, the things we come to find of value are almost the opposite of what we value today. What contributes to stability and soundness and to valued relationships is exactly what prevents and hinders disruption, change, and growth -- which have been both necessary and desired under the conditions we have until recently experienced. Meaningful work localized economies, diversity and richness of employment and community, and controllable, clever, human-centered technologies will become important. Common sense and intuition will be recognized again as more valuable than armies of computers. Community will become more important than individualis and our present actions seen as unsupportably selfish. Strong roots and relationships will become more important than mobility. Buildings and equipment with long life and lower total costs rather than low initial costs will be favored. Cooperation will be seen

as more positive, wiser, and less costly than competition. Skill-using will replace labor-saving. We will soon discover that all our present sciences and principles are not unbiased, but are built upon values promoting growth rather than stability, and will need to be modified when quantitative growth is no longer possible.

Appropriate Technology

Fear of technology is an understandable reaction to a technology that serves values antithetical to our well-being, that destroys personal capabilities and initiative, that requires unsustainable quantities of resources, that degrades our surroundings, and enriches the few at the expense of the many., But such fears need to be qualified if we are to move on to new dreams. Every society develops a technology appropriate to it, and for every dream there are techniques that make it attainable or unattainable. What is necessary for us is to replace our present technology with one appropriate to our new dreams and new conditions. Appropriate technology, in this sense, is not merely a question of machines and tools, but of the nature of all the organizational, conceptual, political, physical, and spiritual tools and techniques which are brought into play by our actions.

Continuation of present technologies is neither possible nor desirable. The technologies themselves are proving socially, environmentally, and spiritually damaging, and often uncontrollable. The values they support are no longer desired, and their product no longer seen as the primary wants of our society. And alternative technologies are available.

Technology appropriate for our emerging needs must fulfill the following requirements:

* Provide full employment and meaningful work.
* Substitute human resources for energy and material ones.
* Operate capably within the levels and patterns of activities sustainable with renewable energy sources and material recycling.
* Promote equity, independence, soundness, stability, and other values appropriate to a sound and enduring society.
* Be easily applicable on a broad scale and to both urban and rural areas.

* Be affordable in terms of money, energy, materials, and human, environmental, and social costs.

* Establish a self-sustaining and expanding reservoir of skills and self-confidnece.

* Permit easy control of political, economic, and social systems.

* Establish a small enough scale of operations to permit and contribute to social, economic, and environmental diversity, stability, and control.

* Provide the best possible support for not only our material comfort, but our psychological, cultural, and spiritual growth as well.

* Reduce economic, social, and political dependency between individuals, between regions, and between nations.

* Permit ownership of the means of production by those who do the work.

Such technologies provide better responses to our emerging scarcities, are fundamentally better ways of doing things, and are necessary to protect our freedoms and other basic values. They permit lower investment costs for good production, wider potentials for entrepreneurship, and more appreciative attitudes towards human skills and work.

Such technologies do, in fact, exist and have been widely tested under stringent conditions in many developing countries where resource limitations have always been severe and social questions of equity and distribution have not been avoidable by assuming that plenty would soon be available for all. Their even greater value, when applied to overdeveloped countries, is rapidly being proven. Ironically enough, this is occuring in places such as England, Canada, and Japan -- where large scale, energy and capital-intensive technologies have been most successful and have most clearly shown their shortcomings and negative effects upon our quality of life.

Technologies that ensure employment, independence, comfort, and quality of life are the normal outcome of almost any cultural development. They have been displaced by our oversized mechanized systems because of the short-term availability of massive energy and material resources and our accompanying assumptions concerning economics of scale and the benefits of institutionalization We have been willing to allow unprecedentedly large organizations

the freedom to prove their assertion that they are the best possible avenue for improving our lives. The consequent energetic, economic, and political power of large organizations to secure advantages for themselves have given those systems the appearance of being natural outcomes of economic activity rather than the expensive, unsustainable, and damaging systems that they are.

The assumptions upon which present production processes have been built are no longer supportable:

* Means of production that return the greatest short-run profit are a better choice than ones that are sustainable.

* Continuously increasing capital intensity of production is both possible and the best way of increasing production and minimizing costs.

* Political and social effects of how we do things are less important than the "economic" effects -- that "efficient" production gives greater social benefit than ways which cost more directly but offer greater social benefits and fewer social costs.

* Our capacity to purchase goods and services will continue to increase.

* Production is the primary importance and role of work.

* Inequality of income, wealth, and control of production and political processes is necessary for sound business operation.

Our assumptions that larger and larger scales of organization would prove more economical has been conclusively disproved through more comprehensive accounting practices (inclusion of externalized and secondary costs, energy accounting, etc.) and through the development of new and more appropriate small scale technologies over the last dozen years. Where economics of scale have existed, they have long ago been passed by the increasing size of our industrial and other organizations. This has occurred because it has been more profitable (not efficient) to do so, because power is a more central goal of such organization than economics, because diseconomies of worker morale, internal organization, and energy use were not accounted for, and because it has been possible to externalize or transfer costs (such as pollution) to consumers and to the public at large.

The profitability of large organizations has been fundamentally based upon centralization of profits, monopolistic market pricing and control, and taxation and other legislative advantages that the power of large organization has obtained -- NOT fulfillment of their purpose at least cost to society.

TECHNOLOGY IS POLITICAL AS WELL AS ECONOMIC

The implications of the way we choose to do things are far wider and more significant than the criteria of the dollar cost of the immediate actions. Smaller scales and regional autonomy in the ways we produce our goods, make available our services, and control our social processes is possible. Such technology is necessary to our political and economic health for many reasons:

* It permits more knowledgeable meeting of local needs.

* It prevents centralization of production and therefore removal of profit from the region concerned, preserving greater equity in profit distribution and permitting full benefits of work to remain within the community.

* It allows the ability to buffer a region from effects of outside economic changes.

* It increases the diversity, stability, and soundness of local employment opportunities and community life.

* it maintains comprehendible and controllable scale of activities, organization, and mistakes.

* It permits people to retain responsibility for the social, political, economic, and physical environment where they live, and the power to meet that responsibility -- which cannot occur where there is political, economic, or financial dependence on others or control by others.

* It allows more economical operation through minimizing transportation, allowing greater interaction of local industry, and permitting greater use of local resources.

* It allows more people to be employed directly in production rather than in secondary services, thus permitting fuller employment and more viable operation under conditions of lower resource availability.

* It makes unnecessary many expensive or unavailable finance, transportation, education, advertising, management, and energy services.

SMALL IS BEAUTIFUL

Even before the energy costs of transportation and operation became an important aspect of patterns of production, the realization that smaller scale of operation was often more effective than large ones was becoming apparent. When forced several years ago to design small scale oil refineries for oil producing nations, the U.S. petroleum industry was surprised to discover that small refineries could actually operate less expensively than large ones.

It has now been repeatedly demonstrated that, given competent engineering design, capital-to-output ratios of present facilities can quite commonly be equalled or improved by mini-plants that have often only one or two percent of what has previously been considered minimum economic capacity, yet which substantially increase employment opportunities. In other cases, much of the real efficiency of large organization has been its ability to apply inexpensive energy to do our work, yet we now have technologies that permit equally effective use of energy in small applications. As energy becomes less available, economic benefits of small industry become much greater than large industry because of less need for transportation and greater ability to substitute human resources for energy ones.

Egg carton plants with a capacity of less than one percent of previous economic minimums are now in operation. Other mini-plants have been designed for producing wood particle board with a capacity of 6½ tons per day as opposed to accepted minimums of 1000 tons per day. More than 900 small scale sugar production plants have been set up in India, Pakistan, and Ghana that produce only 100 tons per day, as opposed to a former size of more than a thousand tons per day. They offer four times the employment and cost only one-fourth as much per ton as larger mills. They also reduce transportation needs and impart greater diversity and strength to local economies.

Small scale brick plants, foundaries, and many other types of production facilities have been developed for application in both developing and overdeveloped countries. Small scale total energy systems which use the heat wasted in electric power generation for process and space heating are proving greatly more effective than large scale electric generation systems.

In many cases we have also been reminded that our needs can be met much more effectively merely by elimination of self-indulgent demands. Very good high quality soap can be produced inexpensively by small scale processes. It is only when we demand perfumed soap that complex, expensive, and large scale production is

necessary. Perfumed soap requires the removal of the glycerine -- a complex and expensive process. Otherwise, the glycerine evaporates, taking with it the scent. Without perfuming soap, it can be produced on a much smaller scale, and much less expensively.

The fundamental reason we need and use so much energy and complex technology is that we have developed patterns of production and use which are indirect, roundabout, inefficient, and untrustworthy. Much of the true cost of production is necessary only because production is divorced from the user. When we examine the costs involved in standardization and regulation of products, shipping, preservation, packaging, management, advertising, buildings and equipment, and employee commuting, we can see why lower technical costs of production are often more than offset by higher secondary costs.

The weight of a loaf of bread is totally unimportant if you make it yourself -- you are going to eat it by the mouthful, not by the pound. Yet expensive weighing machines are necessary in commercial bread production, because the interest there is not eating bread but maximizing profit -- you must give people what they have paid for, but you don't want to give them the least bit more than that.. Advertising is unnecessary if you know the people you are buying things from, but forms a major part of the total production costs in present processes.

Even when lower direct costs exist, they are not always to our advantage. Over-efficient tools can upset the relationship between what we need to do by ourselves and what we need to obtain ready-made from others. They can also, in our own use, produce more output at the cost of less benefit to us in terms of skills and satisfaction gained, and opportunity to use our abilities productively.

Developments in appropriate technology have so far clearly demonstrated that great enlargement of human abilities can be achieved at low cost and with simple yet ingenious and well-designed tools that remove the drudgery but not the skill from work. It has also shown that simplification of unnecessarily roundabout and complex ways of production are possible and can offer affordable, controllable, and sustainable ways of doing things.

Simplified, low-energy clothes washing machines and spin-dryers have been developed. Hand operated washing machines are in production to sell for less than $1. Hand tractors for farmers, electric mortise drills for carpenters, bicycle ambulances, water conserving flush toilets, domestic solar water heaters, and low-energy yet more nutritious fast food restaurants only suggest the range of low cost, low energy; and easy to use tools and appliances that have been developed in the last twenty years. Even some of our present complex devices fit the definition of appropriate tools -- telephones and sewing machines are good examples.

Appropriate technology implies the adoption of people-intensive tools, but not the regression to inefficient tools. It requires a considerable reduction of all kinds of now compulsory use of goods and services, but not the elimination of teaching, guidance, healing, or manufacture for which individuals take personal responsibility.

Serving Whom?

The assumptions upon which we have developed our professional services are equally unsupportable under our emerging conditions as those upon which our industrial production operates.

We have never faced the inherent limitations in providing services to people or in providing them the fullest opportunities for good health, legal protection, learning, and material well-being. We have felt that, given time, we would produce enough doctors, hospitals, schools, and lawyers to be able to give everyone any needed and desired medical care, education, and other services. We could assume that we had the resources and that it was only a question of making them available. Such assumptions ignore now both our resource limitations and the dynamics of professional practice. The resources don't exist for unlimited services, while for any level of health or education made available to rural areas, another higher one is added to urban areas to develop "new frontiers" -- maintaining or exacerbating the inequity.

Equity is impossible when always limited resources are allocated to provide the "BEST" services rather than the broadest and most widely needed. The best invariably requires relatively capital intensive services, more exotic equipment and higher trained personnel, and inevitably leads to centralization and to the availability of services going to the urban, the rich, and the more powerful. The "BEST" is never possible for everyone. Skills, equipment, and techniques are inherently limited, with some people able to contribute much more than others. Combined with unequal ability of people to pay for services, vast disparity in actual availability of affordable services is inevitable. Most equitable service requires allocation of resources in terms of benefit to society rather than to the professions, and expansion of service frontiers which can provide more widespread benefit to society rather than expansion of exotic research frontiers such as organ transplants and sex changes which can only be of benefit to a few.

Exclusive"professional" standards are harmful to both the professionals and to their clients. Professionals must spend most of their time doing routine things that make poor use of their skills, while clients cannot obtain or afford the expense of "professional" skills for routine needs. Levels of service result that are higher than needed in most cases and higher than can be delivered to the entire community. Professionals inherently place greater importance on their skills than on others with which they are less familier, and when allowed to establish professional standards themselves unavoidably demand higher standards than would a viewpoint realizing the many needs and limited resources of most people. Such standards also result in training costs as well as salaries of professionals being substantially higher than necessary to deliver services. They lead to restricting rather than disseminating skills and prevent everyone from learning the skills to take care of their own needs.

Basing responsibility for health, learning and other services outside the individual inherently multiplies the costs of maintaining any level of performance. Individuals then have no incentive to maintain health, to learn, or to prevent problems -- and no skills to do so. Any profession or service based on assuming a responsibility that must remain with the individual will inherently fail. It will be unable to fulfill such responsibilities and efforts to do so will be come unaffordably expensive.

Experience in stringent conditions of developing countries where extremely limited resources have had to be taken as a given has produced benefits for professional services similar to the introduction of appropriate technology to production processes. Resources are allocated to programs with the greatest social benefits, such as public health and sanitation measures which have produced mortality statistics better than those of our own immensely richer country. Medical, legal and educational programs based on community and village clinics, self-help schools, and "one-teach-one" programs have permitted professions to disseminate their skills to the greatest number of people -- raising the range and reservoir of skills in every individual and in society as a whole and making skills most easily available to everyone.

The advances in medical care in China in recent years is legendary in demonstrating the great advances that are possible. "Barefoot doctors" -- local people trained in first aid and elementary medical skills -- have made basic services available in every village and hamlet. Paraprofessionals have been trained in large numbers to handle routine medical problems and to take care of innoculations, birth control services, and public health

measures. Widespread educational campaigns have been conducted to raise everyone's awareness of general problems and enlist their aid in eliminating problems such as VD, TB, and various endemic diseases. Urban based doctors and other technicians have been required to spend part of each year in rural areas learning of the people's actual needs, spreading their skills, and training medical practicioneers.

Distinctions were made early between technical efficiency and social cost -- between what conditions for operating would provide the doctor with the easiest job and the greatest assurance of good performance, and the costs of such provisions to society and to individuals who had to pay for, build, operate, and travel to expensive urban hospitals.

Both traditional Chinese herbal and preventive medicine and Western curative medicine have been employed and taught, and both scrutinized to determine their benefits and shortcomings. The synthesis of the various medical traditions, particularly in areas such as healing broken bones, treating burns, and anesthesia, has proven far better than either previous tradition, and has resulted in the development of an equitable and adequate medical care program on a larger scale, with a speed, and at a lower cost than ever before achieved -- to say nothing of resolving problems such as VD which our medical profession has proven powerless to affect.

Similar potentials exist in all our professional services for permitting dramatic improvement in the level and equity of services available to people, developing greater self-reliance and knowledge of the general population, achieving better use of time and skills of professionals, and substantially reducing costs -- through careful resource allocation, deprofessionalization, and education. Totally self-supporting schools, prisons, and armies exist in several countries -- they grow their own food, build their buildings, make their tools and weapons, grow their own medicinal herbs, and often give to local communities rather than being supported by them.

These approaches have been so much more successful than application of our traditional technologies that countries such as China, Tanzania, Pakistan, and Indonesia have rejected "Western technology" and are firmly basing their development on more appropriate, low-impact, and people-centered technology. Many other countries in both "developing" and "overdeveloped" areas are now developing such programs. Local programs have recently been established in every county of England, and are being established in Canada and the U.S.

Big Things Are Paper Tigers

The changes necessary to refocus our society into ways that are sustainable and beneficial can be significantly affected by our individual actions. They are based upon four interrelated concerns:

RESOURCES: Conservation of scarce energy and material resources, wiser use of human and renewable ones.

SCALE: Adjustment to the smallest viable scales of organization and activity.

CONTROL: Reduction of complexity and capital costs of systems.

WISDOM: Sustainable values, less violent processes, meaningful goals, new means of evaluating tools and institutions so that we might determine and employ only ones that extend and deepen our own capabilities and experiences and unify them with those of others and with our surroundings.

INDIVIDUAL ACTIONS:

* Cut down your consumption and thus the demands you make on our systems that give justification for further growth. Eliminate waste. Reuse and recycle.

* Ensure that your expenditures have maximum usefulness -- purchase tools not TVs, sweaters not lingerie, insulation rather than air conditioning.

* Minimize your consumption of services (walk to work) and establish and support alternatives and non-institutions (buying co-ops, alternative schools).

* Consider what you support with your purchasing power. Buy locally and from local producers. Boycott chain stores and franchises that reduce local initiative and remove resources from your community.

* Make your feelings known where you purchase things about lack of choices, kinds of choices available, and your interest in what is NOT available.

* Examine what you do for its contribution to society. Is what you produce a luxury or does it fulfill a real need? Will what you do be affordable when we are less wealthy? Move towards more useful and secure kinds of work.

* Contribute to public actions -- consumer, neighborhood, public interest action, and governmental groups to regain local and individual rights and responsibilities.

* Use your power at the ballot to prevent and end funding for over-expensive institutions (schools, sewer and highway construction).

* Learn about unethical practices in business, government, and professions, and assist actions to rectify.

* Contribute your specific knowledge of harmful practices where you work to public attempts to expose and rectify bad practices.

* Pressure local financial institutions to give preferential loans to local and small scale operations instead of large outside corporations (after all, it is OUR money).

* Get out of debt. All individual and public credit purchasing is based on the assumption that we will have more resources available in the future with which to repay debts. We know now that we will have LESS resources with which to repay debts, making repayment increasingly burdensome.

* TRY THINGS. Any proposal for changes can be met with a thousand reasons why it might not work. Most such questions can only be answered by trying it. One experiment is worth a thousand buts.

COMMUNITY ACTIONS:

* Examine land use policies and practices for sustainability and future committment of resource use.

* Evaluate proposed capital improvements in terms of their committment of future energy and monetary expenditure for operation, and in terms of sustainability of the activities supported.

* Develop growth control policies to ensure viable patterns and levels of land use, activities, and population.

* Move water, sewage, waste recycling, and other community services to more employment intensive, low-capital, low energy operation.

* Develop neighborhood-based, deinstitutionalized community services, cooperatives, car-pools, home industry.

* Take necessary actions to move community economic and employment base to stable, diverse, and sound patterns, and eliminate dependence on "luxury" industry.

* Regulate scale and outside ownership of business and industry to increase opportunity for local initiative, keep benefits of work within the community, and retain control of the nature of work.

* Develop plans for progressive reduction in community expenditures to decrease strain on taxpayers and to encourage the community to seek more effective ways of obtaining services.

* Educate. Spread the word about what is happening and develop ways for people to gain the skills necessary to best cope with required changes.

PROFESSIONAL ACTIONS:

* Develop paraprofessional programs and public self-help programs. Make training "productive" rather than academic.

* Simplify procedures to eliminate unnecessary professional activity (do-it-yourself divorce and wills, simple burial, owner-built housing).

* Develop preventive programs to minimize need for curative services.

* Modify focus and goals of services to more socially beneficial and equitable ones.

* Speak out as individuals on inadequacies of professions in dealing with problems (sugar and dental problems, failure to handle VD epidemics, imitation foods, radiation and safety problems of nuclear energy, repeating criminal offenders).

* Refocus research programs towards service effectiveness localized and individual-initiated actions, and labor and skill-intensive instead of capital and resource intensive processes.

* Make public the finances and operations of professions.

INDUSTRIAL ACTIONS:

* Realize that amounts of production will be less in the future, and fewer luxuries will be affordable. Minimize new investment and revise expectations for duration of present activities.

* Move to employment-intensive, capital and energy conserving processes. Minimize new capital expenditures.

* Ensure adequate stocks and inventories to dampen effects of stoppages and interruptions of supplies.

* Move towards production of new kinds of products -- more durable, more essential, more useful.

* Develop more localized and smaller scale production and minimize transporation needs. Develop plans for mini-production plants.

* Make finances and operation public to improve community understanding.

* Get out of debt.

UNION ACTIONS:

* Use own funds and pressure on local funds (banks) for setting up members in small co-op businesses. Convert unions from anti-corporate operation to worker associations and take action towards ownership of means of production by the people doing the work.

* Demand meaningful work, employment-intensive technology, local control, and other practices that improve community life quality of union members.

* Expose harmful corporate practices.

* Use political pressure to get tax laws revised and corporate loopholes removed.

EDUCATIONAL ACTIONS:

* Move educational institutions towards greater self-sufficiency and lessen their financial and service demands on the rest of society.

* Learn through real doing rather than academic exercises. Produce things of value while learning. Develop meaningful apprentice rather than insulated academic programs.

* Convert to operating approaches that minimize need for buildings and equipment, as Philadelphia's Parkway School or Montreal's Metro Program have done.

* Disseminate rather than regulate professional skills and knowledge.

* Replace formal education requirements for employment with experience and capability requirements.

INSTITUTIONAL ACTIONS:

* Direct efforts towards useful skills, knowledge, operation, and education for changes.

* Develop ways of operating that maximize individual responsibility.

* Become self-sufficient -- reduce funding requests by 10% per year. Give to the community rather than be supported by it.

* Reduce dependence of people on institutions.

* Disseminate and localize, de-institutionalize services.

* Make public finances and operations.

AGRICULTURAL ACTIONS:

* Move towards independence of fossil fuel fertilizers, irrigation, posticides.

* Convert to use of non-hybrid, non-fertilizer dependent seed stocks.

* Rebuild soil for sustainable operation without chemical fertilizers. Develop sewage nutrient recycling programs.

* Develop local marketing, equipment co-ops, organic certification programs.

* Develop community harvest, U-pick programs.

* Develop better coordination of school and other institutional rhythms with farm work needs.

* Get free from debt and financial control of agri-suppliers.

POLITICAL ACTIONS:

* Repeal present discriminatory legislation favoring large organizations; reform tax laws, invert bank "prime borrower" regulations to favor small, local investments. Prohibit interlocking directorates. Prohibit holding companies. Require that employees be given options on purchase of divested businesses for operation as co-ops.

* Regulate relationships with other regions. Prevent import of outside industry (import techniques only), and

import of products that can be made satisfactorily within the region.

* Favor local industry by techniques such as establishing a heavy tax on all sales while eliminating or reducing state corporate income tax or property tax, thus reducing domestic production costs relative to imported goods.

* Improve small business research, information, aid, services, networks, access catalogs, certification of quality.

* Reduce funding to large public institutions. Require greater self-sufficiency.

* Remove subsidies to large organizations, and make true costs of actions (governmental airline subsidies, tax writeoffs, advertising, pollution) known to the public.

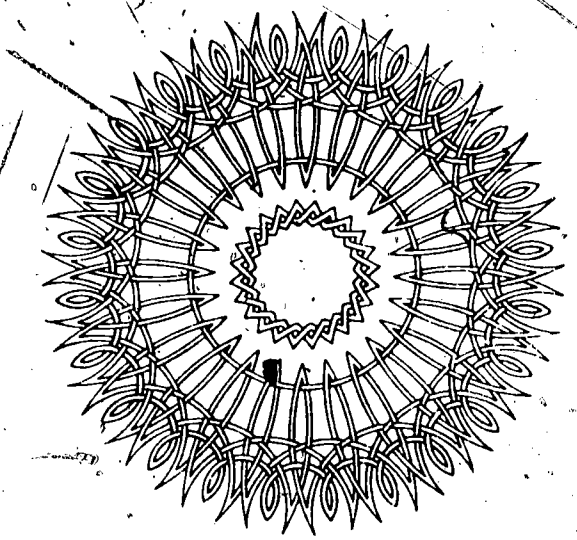
* Tax energy and material use and adopt progressive power rate structures to encourage substitution of human skills for energy use..

* Eliminate use of public media for advertising to promote private consumption and private gain. Eliminate advertising on TV, radio, billboards, busses, etc. Develop community TV, pay TV, etc.

* Tax private advertisement other than classified advertisement, which promotes consumption, waste of resources, degradation of surroundings, dissatisfaction and increased wants, and increases the market power of large corporations.

These changes must and can be made ourselves -- through our consumption, work, and living patterns; through our community and political activity; and through our community, state, and regional government. We cannot expect large scale government, business, or other organizations to make these changes for us, for it would require tham to perceive themselves as harmful to society and require their yielding enormous power and wealth. The trend towards smaller scale of organization implicit in resource scarcity requires that such smaller organization ASSUME their authority and DEMONSTRATE their ability and rightness through appropriate actions.

This is already happening.



DIGGING DEEPER

The following sources can expand on the reasons and means for implementing beneficial adjustments to our new resource realities:

BECOMING SLAVES TO ENERGY:

"World Energy Strategies" Amory Lovins. A brief but clear overview of our energy resource futures. Available from Friends of the Earth.

"Mining and Materials Policy", SCIENCE, 18 January 1974. Overview of depletion schedules for domestic and global material resources. There's already enough mined to operate any sane planet for hundreds of years. Perhaps we should shut down all mines now and learn to live with what we have.

HARMFUL SERVANTS:

"The Multi-National Corporations", Richard Barnet and Ronald Muller. The NEW YORKER, 2 and 9 December 1974. Excellent analysis of the claimed and actual effects of large scale organizations on our societies.

TOOLS FOR CONVIVIALITY, Ivan Illich. Probably the clearest overview of our need for changes and the framework within which changes can best occur.

NEW VALUES:

"The Strategy of Ecosystem Development", Eugene Odum. SCIENCE, April 18, 1969. Exploration of the principles and operation of ecosystems under conditions of growth, steady-state, and contracting energy conditions.

ENVIRONMENT, POWER, AND SOCIETY, H.T. Odum. Difficult but powerful analysis of the principles relating energy and social operations.

THE INDIAN CRAFTSMAN, Ananda Coomaraswamy. Sensitive and perceptive study of the meaning and value of work in a traditional society.

FIRE IN THE LAKE, Frances Fitzgerald. The cultural interfacing of the traditional Vietnamese, modern Communist, and our own American societies in Vietnam. Very perceptive views of the fundamentally different base from which three cultures arise, act, and affect their people.

FANSHEN, William Hinton. A study of one of the 50 experimental villages on which the Chinese have tested their new policies before enacting them on a national level. Revealing documentation of the changes in a village during land distribution and establishment of democratic government.

AWAY WITH ALL PESTS, J.S. Horn. A British doctor in China during the 1950's. Probably the best book available to give a feeling for the revolutions in Chinese medicine and the effects on the people involved.

ENVIRONMENTAL DESIGN PRIMER, "Living Lightly", and other papers, Tom Bender. Explorations of changes in attitudes, ways of working, and of making changes related to our emerging conditions.

APPROPRIATE TECHNOLOGY:

SMALL IS BEAUTIFUL, E.F. Schumacher. Our soundest basis for making changes in our present production and consumption patterns.

APPROPRIATE TECHNOLOGY and other publications of the Intermediate Technology Development Group (I.T.D.G.) in England; and publications of Low-Impact Technology, V.I.T.A., New Alchemy, etc. Current developments in applied changes.

SERVING WHOM?:

PAEDIATRIC PRIORITIES IN THE DEVELOPING WORLD, David Morley. Careful documentation of the effectiveness of innovative health services in developing countries.

HEALTH MANPOWER AND THE MEDICAL AUXILIARY, I.T.D.G.
Good study of the principles of organizing equitable health services under conditions of scarcity.

ENERGY AND EQUITY and THE NEMESIS OF MEDICINE, Ivan Illich.
Dobner probes into particular counterproductive institutions.

BIG THINGS ARE PAPER TIGERS:

"Ways and Means", Lane deMoll. Community actions for adjusting to emerging resource conditions.

$1.50

February 1975

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