The Home Workplace

The Home Workplace:

A Builder's Guide to Its Environment, Energy and Economy

By

Daniel R. Perley

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FOREWORD

Since the advent of microcomputer-based end-user computing in the early 1980's there has been relatively little movement towards mass realization of the home workplace for information workers including individuals, small and medium businesses (SMB's) and those working in large enterprises. For a brief period, it seemed as though home workstations with strong computer-telephony integration (CTI) capabilities would pave the way for a smooth - *and wide-scale* - migration to the home workplace while also fostering truly integrated collaborative workgroups.

Alas, it was not to be. The few technology companies which fully embraced CTI included Mitel, Northern Telecom and others, but they did not detect customer C-level commitment to meaningful workplace decentralization. True too, in the large enterprise 'telecommuting' was in most cases appropriated by Human Resources (HR) who brought a good knowledge of **human factors**, but little or no conversance with the three other equally important factors, being **workflow, technology** and **logistics**. HR thus constructed a one-legged stool where a four-legged chair was required. For the next 25 years they cheerfully predicted that mass deployment to the home workplace was just around the corner. Meanwhile, few large corporations pressured the IT industry for home workstations with full CTI features as described in this book – *features which are still needed today over and above Internet VoIP phones and cell phones.*

This situation left us woefully (indeed almost totally) unprepared for the sudden advent of COVID-19 in 2020 and the resultant (overnight) slamming of literally millions of information workers into the home workplace with technology products never intended for such use. *It also left (supposedly) sage IT authors producing articles advising the new home workers not to work from the kitchen table and to take a dog-walking exercise break at lunchtime…*

Now, the IT industry is scrambling to offer products which do not treat the (remote) worker as a third-class citizen.

However, there is another problem and that is the lack of coherent theory (and documented practice) about what wide-scale workplace decentralization will actually do for the individual, the organization, the local community and ultimately the planet. Indeed, the home workplace can - *and ultimately will* - serve as the gateway to a whole new focus on the triplex of environmental, energy and economic issues. It may even become the portal to a more peaceful and stable world. *True too, democratizing the control of information technology by mass-migrating to the home workplace will quickly end the so-called "tyranny of big-tech".*

This book is not a research work, but rather an opinion piece based on the author's 40+ years working as an IT program manager, executive and consultant in various large enterprises while working from home for a significant percentage of the time. Among other things, it reflects a very strong belief that home workplace technology architects were altogether too quick to abandon the Public Switched Telephone Network (PSTN) as a core component of that architecture. The author believes that the PSTN, Voice-over-IP (VoIP), cellular and satellite technologies each have valid roles to play. For example, the PSTN can serve as an addressing and signalling system for the network of home workplace devices world-wide. The book seeks to equip the reader with a balance of strategic and tactical perspectives - *and tools* - which should assist in designing, prototyping and rolling out a home workplace environment which is best suited to the needs of their organization and which will also contribute to the building of a worldwide electronic commonwealth.

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The author gratefully acknowledges the encouragement and assistance of his business associates Dwane Boucher, Ed Wilcox, Ian Douglas and Andrew Robinson over the 40+ year period during which this body of work was created.

Honorable mention also goes to the late Gordon Thompson of Bell Northern Research and the late Jim Mackie of Mitel, both of whom provided much mentoring early in my career.

CHAPTER 1

INTRODUCTION

1.1 General Introduction

1.1.1 Purpose of this Book

This book puts forward the proposition that the development of the home workplace is of crucial importance to the future of Western economies in general, and those of North America in particular. The home workplace encompasses '*telecommuting*' (wherein those working for a large organization with a conventional office work at home part or all of the time), the 'decentralized workplace' or '*virtual corporation*' (wherein an organization is built as a collection of home workplaces, entirely without an office) and also the *small-office-home-office* - individuals who work from home.

>>> This book is written from the perspective of a Canadian, now living in the United States. Nonetheless almost all of it is equally applicable to the American situation.

1.1.2 "*Forward to the Land*"- From Scarcity to Surplus

We are now facing the challenges of economic re-orientation, the need for better energy management and increasing environmental decay. However we also possess a very special opportunity, one not as readily available to most other Western democracies. Our great expanse of land, once seen as a barrier and a handicap, could now prove to be our greatest advantage. Now that microelectronics technology has made information the raw material of work for most of us, there is no particular need for many of us to migrate to the office each day.

If we can work at home much of the time, then we can choose a location much more distant not only from the office, but even from the city itself.

At such a place, we could - using robotics technology far less sophisticated and costly than that already in use in industry - produce much more of our own food and energy ourselves. Our lower density would also reduce pollution and congestion, but would not deprive us of access to the services and products of a metropolitan area, since with far less commuting there is more time for multi-purpose utility and recreational trips. Nor would the home workplace bring personal isolation or destroy the employer organization, although major changes in organizational culture would be required. While workplace decentralization would assist any liberal democracy, we North Americans are in the ideal position to pioneer it because we have advanced communications technology and a lot of space!

A population which moves *'forward to the land'*, distributing itself more evenly across the geography, would demand not only a previously unknown level of access to services in rural areas, but also locally responsible (and responsive) government. This transformation can be accommodated within the liberal democracy we now enjoy, but will require both technologically enlightened leadership and a severe housecleaning of the ethics and integrity of the political system.

It is suggested in this book that we should adopt large-scale publicly planned and led – *but privately implemented* - workplace decentralization as a primary political, economic and technological goal. The organizational and individual benefits of such an approach are then discussed. Much of the book might also apply (at least to some extent) to Europe and certain other advanced societies as well.

Virtually all of our capitalist economics is founded on the principle of scarcity; it is the basis of our ability to predict individual and group behavior in rating the relative values of goods and services against each other or the bean of the realm. However this, and our concept of 'utility', are overdue for some basic revision. For example, some things just are not scarce anymore or at least they need not be; they have in fact ceased to be actually scarce but have been transformed into a *synthetically scarce* state. We in the industrialized world can very rapidly produce enough food, clothing, shelter and medicine for everyone on earth, but thousands of people die of hunger, exposure or disease every day.

We have moved not one inch towards creating a 'dual' or 'bicameral' economy which recognizes the stark fact that we do not need to have scarcity in the 'basics' any more. We can still have officially recognized

and sanctioned market scarcity of gold bullion, diamonds or aircraft if we like but we don't need to have scarcity of food any more; surely we have seen enough children starve. Economists have failed miserably to make economics work any better in this respect.

And so we have a situation where finance experts, commodity market traders and their economist friends determine that farmers will do poorly whether the harvest is great or small - a circumstance which lets millions of tons of food rot in the bins. Either way the Third World child will starve.

Socialist and communist economies were for a time able to 'piggyback' onto the technological revolution in the West and to then, by fiat, create dualistic economies with lower prices for food. But this had several problems, as in the case of the former USSR. They were not even able to *steal* technology from the rest of us fast enough to stay current, their system stifled initiative and engendered profound mediocrity. Ultimately it had to be changed.

We are absolutely correct in our desire to preserve the capitalist system which, tempered with our 'mixed economy' model (in Canada), has served us quite well. But we are also at the tail end of the industrialized pack in seeking to make the jump to economic 'hyperspace', the so-called post-industrial economy. We just haven't a clue what it is.

1.1.3 Home Workplace and the Environment - *The Theory of E3*

I personally believe that the widespread implementation of the home workplace is the appropriate means and solution for Western civilization to make peace with the environment and to secure long-term, non-fragile economic growth and prosperity. This would, from the environmental and lifestyle perspectives, have a number of very positive impacts. These include:

- reduction of mega-capital concentrations, mega-energy demand and mega-pollution due to lower population density;
- greater individual economic and physical independence; and
- increased opportunities for community and recreational involvement;

The **Environmental** (reduced density and waste), **Energy** (conservation) and **Economic** (revitalization), or **E3,** impacts of large scale workplace

decentralization would be phenomenally beneficial. We would also be much freer to locate where we choose, to move without changing jobs and to change jobs without moving. Also, with less commuting time, we would have more time for recreational and community involvement.

We would require the availability, to home subscribers, of a communications service package able to be custom-tailored. We need, indeed we must have, this kind of offering to the householder in order to make the home workplace fully possible. True too, it is about more than bandwidth. Hopefully telephone companies and other private sector communications channel providers will fulfil this requirement. If all else fails, it will fall to the government to bring this about – in the same way as we build a road.

There are important E3 benefits to the home workplace. We can increase the degree of self-sufficiency at the household or homestead levels in such areas as food production, income generation, energy generation, vehicle fuel production and others. The study of E3 is also called **Trinomics**.

1.1.4 Microeconomics of the Home Workplace

The implementation of the decentralized (home) workplace will become economically viable at, or shortly after, the time of the development of the correct combination of functions performed by using present electronics technology and various other technologies now available. The economic 'crossover point' for a given organization is the point at which all fixed and variable costs attributable to an individual worker are lower when that individual works at home. Most organizations today work primarily with information, which can be worked with just as well from home, once the worker gets used to this mode of work. Individuals would have greater independence to work for more than one firm, to move without changing jobs and to change jobs without moving. This potential depends upon early public sector leadership, to underline the importance of the home workplace, provide the required trunk systems and establish national standards.

The home workplace will not detach the individual from the organization either in the formal or the informal sense. Nor will it create a new isolation. Even the single person living on a homestead 50 miles from the city will have a wider range of recreational and cultural opportunities (and will be able to find them more easily) than he or she would now even if living in a downtown apartment.

Whereas the state has the power to regulate/arrange most things in its purview (except purely private matters) I submit that there are four PRIME INTERMEDIARIES between the state and the individual. These are the *bureaucracy*, the corporation or *enterprise*, the *co-operative* and the *political party*; all of them will to some extent work to help create for us the home workplace and all of them will to some extent depend upon it. Co-operatives will permit electronic communication and co-operation among home workers on a temporary or permanent basis. The issue, therefore, is for the state to provide the FRAMEWORK which will permit local individuals to determine which intermediary best serves each need.

The technological requirements to support the home workplace include communications resources to tie together the bridging devices which, in turn, link the networks to the specific computing systems in the home. These products and services must be provided in an open and competitive market, not one dominated by a cartel of very large vendors. They must adhere to standards set by government and industry.

1.1.5 Building the Electronic Commonwealth

Once provided this access, the widely replicated combination of the home-based human being, the computer/bridge and the communications medium become an integrated and (both artificially and genuinely) smart network. Simple and difficult questions can be posed to the network of home workplace devices which can, in fact, respond on behalf of their various owners. Who would like a sub-contract to do X? Who wants to have an informal golf tournament next weekend? Who wants to help clean up that vacant lot? The bridging device thus ‘networks’ the information of the owner; it permits selected bits of the owner’s total information to be released onto the network in the form of an apparently animate ‘travelling question’. These queries can be received, answered and passed on automatically by the home workstation devices (because they know their owners’ propensities) even when the owners are away!

We have failed to see that the real benefit of the information revolution is that it will make information the raw material of work for most people. We can use microelectronics technology to allow many people to work at home even though remaining part of their organizations. This application of existing technology is referred to throughout this book as the ‘home workplace’, something which has been technologically possible for several years. It would reduce urban concentration, energy consumption and

pollution and would promote regional economic equality. More importantly, the home workplace would also (sooner rather than later) promote trade among individuals in information about things, information about services and ultimately information about information. If we give a man in India a computer, he creates an information product of interest to us and we then pay for it by electronically transferring dollars to him, allowing both of us to benefit. Given our shorter working hours at home, he would help save us from boredom while we help save him from starvation. Also, he would spend some of those dollars to buy goods and services here.

Clearly, the subject matter treated in this book covers an immense territory; it recommends a program of transformation going far beyond the *'information revolution'* as it is now commonly understood. It bespeaks a world where we might not only never go hungry or cold, but also one where we might never again occupy a cuabicle, punch a time clock or risk the supervisors admonitions about the company dress code.

1.2 Influences and Perspectives

I have had a real interest in the potential for the electronically fostered home workplace since the late 1970's, based on my rural background, education and work experience. As the only child of rural non-farm parents, I soon learned to substitute communications for transportation (and also to make maximum use of the latter whenever it was available) in keeping in touch with friends and to accomplish other objectives. Having studied public administration and transportation engineering in university, the potential for government to sometimes take the lead (rather than just being reactive) in addressing the application of new technology intrigued me. So did the wider potential for a transportation-communications trade-off. As a participant in Canada's advanced technology industry, working both in small and large firms and in government, I realized the tremendous potential which the new technology offers to the home workplace, and which the home workplace, in turn, offers to all of us.

The writings of the late Gordon Thompson (of Bell Northern Research in the Ottawa area) and of J.J. Sevan-Schreiber (of the French information technology establishment) influenced me far more than Toffler's ideas about the *electronic cottage*. They addressed new ways of using technology to assess information, and ascribe value to it, in the context of the larger organization and - indeed - the economy at large. In 1983, I presented a detailed brief on the potentials for the home workplace to the

MacDonald Royal Commission which had been set up to study the Canadian economy. I also for several years ran a company which sold and integrated desktop workstation equipment ideally suited to the home workplace. However, the 1980's also taught me that just because the basic technology is available that does not mean it will always be wisely applied; and just because it is applied that does not always mean the application will be a success. The changes in the cost and speed of processing information since the 1960's have been so immense that they have only just begun to work their way through the system. Humans have been adapting at a much slower pace than technology has been changing. And organizations have been learning and adapting at a still slower rate than their constituent individuals. While 'telecommuting' is now spreading rapidly, it still comprises far more individual professionals and small business people than those working for large corporations or governments. A wider (and more farsighted) vision of the home workplace, one which can be universally shared, has yet to emerge.

I also owe much to the late Jim Mackie, formerly of Mitel Corporation and Newbridge Networks Corporation, whose constant encouragement - and willingness always to make time to discuss yet another new idea - contributed much to this book.

1.3 Chapter Structure

The book has been structured so as to provide a logical and incremental treatment of home workplace historical context, near term possibilities and longer-term potentials. Chapter 2 backgrounds the current juxtaposition of economics with energy and the environment while Chapter 3 suggests that the home workplace could promote Environmental, Energy and Economic (E3) reconciliation. Chapters 4 and 5 provide, respectively, the economic and the organizational underpinnings of the home workplace while Chapters 6 and 7 discuss why and how home workplace devices might communicate with each other automatically. The use, in the more distant future, of home workplace devices to foster a new form of capitalist economics is treated (although by no means comprehensively) in Chapter 8 which seeks to draw some general conclusions. Chapter 9 offers some current context and practical assistance in getting started with a personal or organizational home workplace project.

In various places throughout this text, I utilize a point-form schematic format so as to organize complex material most efficiently. What is

sacrificed in quality of prose will hopefully be recovered in more precise communication of a very large and complex subject. The reader's indulgence is therefore both begged, and appreciated.

CHAPTER 2

THE HOME WORKPLACE AS HISTORICAL ALTERNATIVE

2.1 The Home Workplace in Historical Perspective

2.1.1 Historical Starting Point

It is clear that European and North American society has been grounded on a complex of physical and spiritual views such that we have been required to balance our time, concentration and energies between the spiritual and the material realms. Until the 20th century, most people were content to have their basic (and only a few other) material needs fulfilled, and sought out their personal and spiritual happiness with whatever small time and attention surpluses they could generate via largely non-material means. They made their own fun. When we have turned our attention to the physical realm we have tended to see it as a gift to us for our (almost) exclusive use, to do with as we please. Various revolutions of thought in Europe between 1400 and 1800 aided and abetted this.

Humankind reached out on two separate axes, one spiritual and one physical. In the physical axis there was the attempt to CONTROL the human and animal/mineral ENVIRONMENT. Whether it came from the Supreme Being, only from our progressive incremental inventiveness or from a combination of the two, humankind developed TECHNOLOGY which we shall define as 'the application of vision to the immediate material (the components or factors), fashioning thereby elements or entities able to influence the wider material (the environment)'. We applied vision to something nearby and thereby were able to use it (or the successor or superset result) to impact the wider environment.

Some of our early technological developments included the creative use of tools, the establishment of long term shelters, organized agriculture, the smelting of ores and the wheel. Later, the printing press, the development

of true science and various medical discoveries had a profound effect on how we lived. The steam engine, electricity, the telegraph, the telephone, the internal combustion engine, the light bulb, the airfoil and the turbine engine all followed, along with the transistor and integrated circuit. Each, in its turn, has increased our leverage and power over each other and the environment. As each new technology was perfected and deployed, the environment into which it intruded was seen by many as just one component of man's existence. Man (and woman) benefitted from the natural beauty, balance, self-renewing capabilities and available raw resources of the environment. However in turn we mauled, modified and fashioned it for our own use, casting back to it whatever we were finished with. Along this HUMAN-ENVIRONMENT axis there was a severe imbalance of trade, with mankind getting the raw resources but the environment getting the raw deal. Put another way, there was a three-tier system. The environment was the bottom tier and technology could be seen as a second tier, sitting on top of the environment. Humans fashioned various technologies which, in turn, supported them at a higher (third) tier.

In the 20th Century, we finally came to see that if the environment should crumble or succumb that the other two tiers will come crashing down as well. We had earlier tended to forget that the environment is the default for our life - it can continue without us but we cannot continue without it. This fundamental non-reciprocity has been copiously ignored through most of recorded human history - and there is no particular reason to believe it was all that well respected in pre-history either, except that pre-bronze age people had a more basic concept of life and the land. They (for example the North American Indians) felt the land was important in terms of their presence upon it and their use of it, whereas the newcomer Europeans emphasized claim, ownership and control.

While various industrial historians do not agree even with each other on the subject, it is my view that the first English industrial revolution (and the steam power that drove it) was a turning point in that its 'quest for power' took us beyond just being able to modify the environment; we became able to over-power it. Our mines, cities and factories and the resulting pollution soon made this clear. During the 19th century environmental feedback (such as the air, ground and water pollution in and around London and other cities) was seen as nothing more than an 'aberration'. Also, and more importantly, from this point forward it was far more society, the economy and government which had the major impact on the environment, and no longer individuals or small groups.

Decision-making about actions at the corporate level used a very simple profit model which basically went like this:

- can we project a profit;
- can we carry out operations successfully; and
- can we mitigate any interference which may come from individuals, government, the natural elements (weather, animals etc.) or loopback/cohort problems (our operation sullies itself or is sullied by the operations of others)?

Of course, there was never any consideration of environmental impact unless it was loopback; we had to pile the slag just far enough away to allow the mine to continue operations.

2.1.2 Humanity and the Environment

All of the above is 20/20 hindsight and is hardly news. But there is a relevant cause that we don't think about because we don't like to. It is worth noting (and I am not the first to do so) that even most relatively advanced corporations display the input/output response of at best an earthworm or at worst a protozoan. They retreat from unfavorable stimuli but are otherwise difficult to communicate with. In his 1981 paper entitled *Office of the Future Revisited*, Gordon Thompson pointed out that:

> *"Old style businesses processed their environment by eating it. Their sensors were simple things, and in biological terms, their nervous systems resembled the nervous system of an earthworm*."

Generally, new ideas only permeate such organizations when they are hit with the political or economic equivalent of a baseball bat. GM started making better small cars only when North American buyers deserted it in droves. IBM began the move to open systems because even its traditional customers wanted to be less vendor-dependent and because the U.S. Department of Defence forced the issue.

2.1.3 The Enterprise and the Environment

This problem has been made much worse over the past hundred years or so by the financial and accounting communities in such places as the U.S. and Great Britain. They seek to reduce everything within the corporation and also in the environment at large to otherwise unwarranted simplicity

for costing and comptrol (barely distinguishable in many organizations from *control*), not to mention audit. Mining, forestry, petroleum and utility firms have gone to heroic lengths to convince not just us, but also themselves and their shareholders, that they are truly not threatening the environment even when strip-mining, clear-cutting or spilling millions of gallons of crude oil into the ocean.

On the other hand, the individual is very capable of knowing whether or not he is polluting, and also of recognizing the pollution caused by others. He is NOT capable of fooling himself for very long into thinking that he is not polluting when he really is. What is more, it is extremely difficult to brainwash the individual in this respect, just as you cannot fool a baby into thinking that his diaper is clean when it is dirty. Perhaps focus, or at least perspective, has something to do with relative size. An individual can well look after a garden but not a country; a monolithic dictatorship is only effective if you have a perfectly enlightened, benevolent, honest and incorruptible dictator who never tires and gives prompt and close attention to all important matters... Conversely, a government or even a large corporation might manage a country but would have trouble managing a garden or caring for a young child. Our social and economic system is as irrelevant to the environment as is a digital watch when you are lost in the woods. An old Native man once told me that many white men perished when lost in the bush because they remained pre-occupied with what time it was. They did not realize that in the bush there is day, transition time (sunrise and sunset) and night and beyond that time is not relevant at all. The organization has its own internal ‘system’ of social and economic factors which interact with each other and, thereby, largely drive its perceptions. As we have all seen, culture, prejudice and the inane stupidity of petty political rivalries can all serve to warp or curtail these corporate perceptions about the real world.

Beyond their socio-economic power, large organizations also possess technology giving them immense leverage upon great numbers of (their own and external) people and upon the environment. They usually have the intended impact on the environment, but the feedback FROM the environment can easily be filtered, muffled, shunted off to the research department or can become the stuff of internal conflicts among rival factions. In other words, it doesn’t get responded to. The individual, on the other hand, has needs, a conscience and more acute perceptual machinery which allows him to very rapidly determine that his leaf fire has now become a tree fire or a house fire, his kid is fouling the backyard pool or that the poison ivy is spreading.

Indeed, the approaches of the individual and the giant organization to the environment are so much at variance that there is little wonder they have so often fostered conflict. This conflict has been of three primary types:

- direct competition, such as:
  - peasant farmer vs. enclosed sheep farm;
  - peasant farmer vs. involuntary kolkhoz (collective farm);
  - homeowner vs. freeway;
  - environmentalist vs. airport, nuclear powerplant etc.;
- mutual interference, such as:
  - fisherman vs. pulp mill;
  - hunter vs. rapidly urbanizing municipality;
  - Native hunter vs. low flying jet aircraft;
- moral indignity, as in:
  - animal lover vs. seal hunt;
  - animal lover vs. lab animal-keeping organization; and
  - Greenpeace vs. whale slaughter;

Enough has been written recently regarding environmental issues in general, and pollution in particular, to fill a house with books from basement to roof. There is no question that we have a serious problem which could become a fatal one (for all of us) if we don't do something about it. Environmental concern is justified; *environmental panic and 'sky is falling' behaviour are not.*

2.2 The Density Paradox

2.2.1 The Density-Wealth Relationship

We face a terrible challenge which is almost a paradox; how are we to preserve our standard of living, which is so much improved over even a century ago, while returning to a better co-existence with our environment? Strictly speaking, however, a significant percentage (but by no means all) of our pollution problem arises directly or indirectly from the fact that we have increasingly *chosen to concentrate ourselves closely together*. Even in the times of early humankind, if too large a concentration of people remained for too long in one encampment the whole local environment would become fouled. If they hunted too long in one area all food would be gathered, killed or chased away. The environmental feedback would make it imperative for at least part of the group to move on. With the coming of the industrial revolution, our need for mega-concentrations of

labor (and large markets for the industrial goods), and the inability of the transportation system to permit this increased level of access to occur, caused people to congregate more and more in towns and villages. These eventually grew to become cities. So awed with our startling progress were we that there was little concern that these new industrial towns blighted the environment and were not very pleasant to live in. The better access to goods and services and the escape from the drudgery, prejudice, ignorance and boom/bust economy of the land were nonetheless powerful inducements. As pointed out above, the industrial organizations themselves were not very concerned about the side-effects either, focussing themselves totally on operations.

There is nothing inherently good or bad, desirable or undesirable, about any particular mode of habitation, be it rural farm, rural non-farm, village, town, city or mega-metropolitan center. They each serve their purpose and have their place. The problem is that if one comes to be seen as the panacea and is used to the detriment (or even exclusion) of all others, then we have a major problem. We lose balance. This problem relates to the feedback loop. Most small villages and towns cannot afford to send their sewage or garbage hundreds of miles away and they are therefore forced to live with the consequences if they fail to practice good local stewardship.

On the other hand (because of their much greater landmass and huge revenues) regional municipalities can have multiple dumps or even export their garbage entirely. They can thus studiously avoid the day when they have to face up to poor waste management. People who live in apartment complexes were told in TV commercials that cold milk comes '..fresh from a jug'. Having never actually seen anyone milk a jug, I was a bit incredulous at that particular television commercial.

People brought up in urban areas, despite our landed system of representation, became the absolute majority in the Canadian Parliament in the 1950's and soon permitted the highly subsidized U.S. interstate highway system to be used by trucking firms and supermarkets to artificially lower food prices in real terms. This devastated the local truck (mixed) farming industries in many parts of the country, doing us no favor whatsoever. Again, the feedback just didn't get through to decision-makers that a healthy mixed farming operation was better (in both environmental and economic terms) than the dairy, beef or even hay monoculture that many farmers were then forced to turn to in order to survive. There is nothing wrong with California lettuce when it is out of season in Canada or the Northern United States, but we should surely have been paying the real price for it