CHAPTER 10

THE LEGACY OF MODERNISM AND LE DEFI MONDIAL

Success always breeds its own failure and Modernism is no exception to this rule. It’s virtues, driven too far, have become vices. Together, these vices constitute a large part of Le Défi Mondial (The Global Challenge).

Modernism and the Environment

Perhaps the biggest impact of Modernism has been on the related areas of population growth and environmental destruction. Modern people live longer for the reasons we discussed in chapter …… Death rates have fallen dramatically, especially for infants and children, but birth rates have been slower to fall, so human populations have grown unendingly. As the modern way of life traveled from Europe and North American to Asia and Africa in this century and increased life expectancy traveled with it, the world’s human population has exploded. World population will still increase by one billion or twenty percent by the end of the century compared with 1980 and by another two billion by 2050. The world total in 2050 will be eight billions, twice the population of 1980. Sheer pressure of numbers is having devastating environmental effects. For example deforestation has accelerated as burgeoning populations seek wood for fuel, building material and paper and clear forests for agriculture. Fishing pressure has decimated wild fish stocks, source of most of the animal protein used for human consumption, and the global catch is steadily falling.

In various countries, particularly in West Africa, traditional social (tribal village) governance has broken down as burgeoning populations move to the cities but what has replaced it is juvenile gangs and inefficient, corrupt autocracy. There is no personal security and diseases like malaria have reached epidemic proportions. Civil wars have been common, destroying infrastructure, driving people off the land so that food production falls and malnutrition becomes commonplace, and turning millions of people into refugees. Starving, unprotected people flee into the forests and come in contact with new parasites (diseases) – probably the origins of the AIDS and Dengue fever epidemics. Prostitution is a major way of life, impoverished health care systems reuse needles and so the spread of sexually transmitted diseases like AIDS has become epidemic. A whole generation of young adults is dying, leaving only children and old people. Macroparasitism (men preying on men) and microparasitism (microbes preying on men) are synergizing in their usual grim dance.

Unless mankind radically alters the means by which it sustains itself, the extra billions will only be accommodated at the expense of significant further degradation of the biosphere and pandemics of disease. The effects of this population increase will likely be non-linear. We can’t rule out the possibility of outcomes which are a multiple of the initiating activity. One distinct possibility is extreme changes in weather patterns at northern latitudes and even climate from things like deforestation in the equatorial region. Another very real risk (and one of the possible non-linear effects) is the emergence of new, deadly infectious and communicable diseases as the ecological disturbances caused by deforestation and human migration bring humans into contact with pathogens they have not faced before. All past
historical pandemics of disease have had their cause in severe ecological changes like the one we face now, usually caused by sudden changes in climate.

Canada’s future will be deeply affected by the consequences of world population growth – in terms of demand for our resources, in terms of economic competition, in terms of epidemic disease and in other ways we cannot yet discern because it’s effects are too complex for our current models to explain.

All over the world this growing population has been migrating to the cities and taking up the modern way of life. By 2025, the United Nations estimates that the proportion of world population in the cities will approximately double to more than one half of the total. In 1950 there were seventy five cities of more than one million. By 2000 it is anticipated that there will be four hundred and fifty. Canadian cities will face enormously intensified competition in some economic areas, enormous opportunities in others, for example in design and construction of infrastructure. In these cities the interaction between old cultures and the demands of modernity and urban life will lead to many social and economic innovations which we will import. We are already learning from Brazilian cities about how to integrate social and industrial planning with multi-modal passenger transportation systems. Communication with the cities of the developing world will introduce a whole new world of ideas about social organization.

Organizational and Physical Scale

One of the defining characteristics of Modernism is the scale of things – of cities, of buildings, of factories, of transportation systems, of farms. In pre Modern times there were large things like the pyramids of the Middle East and Central America, the cathedrals of Mediaeval Europe, the Colossus at Rhodes, but they were isolated instances, rare giants among pygmies; in Modern times giantism is the norm.

It mostly has to do with economies of scale combined with modern materials. Other things remaining equal, doubling the size of a building does not double the amount of material required, so the cost of material per unit of space declines as the size of the building increases. The same is true of any container, whether it is a building, a ship or a rail car. Heat is lost more slowly from a large mass than it is from a small one, so in processes where retention of heat is economically important as in the production of steel or petrochemicals, energy costs per unit fall with the scale of production. Fixed costs like land and buildings do not vary as the level of output varies, so the higher the scale of production the lower the per unit fixed costs are. The larger a workforce is, the more individual workers can specialize in specific aspects of the production process. The more they specialize, other things remaining equal, the more productive they are.

Economies of scale are the unsung heroes of Modernism. They make possible the low cost food and consumer goods which make the high living standards of modern times possible. Advances in materials, particularly low cost steel, have been extremely important in increasing economies of scale because their high strength to weight and low cost make the construction of very large containers, among which I include buildings, possible.
At the same time they are also the unsung villains, for they encourage a scale of production and an intensity of resource use which is highly entropic. Fritz Schumacher’s point in Small is Beautiful was that there is a cult of giantism in Modernism which leads to excess scale, especially when external costs created by entropy are factored in.

There are in fact diseconomies of scale. Large homes on large lots require very high per unit investments in infrastructure — roads, sewers, gas lines, power lines, telephone lines etc. Once cities pass a population of about 500,000 to 750,000 the costs of things like policing, transportation infrastructure, land and waste disposal grow faster than population. Under a hierarchical management system, the larger a workforce grows the more alienated it becomes and then its productivity falls. Again, under a hierarchical management system, the larger an organization grows the less flexible it becomes. The larger a hierarchical management system becomes, the greater the entropy in the communication from bottom to top, that is, the less accurate it becomes. At each level the subordinate distorts the true message towards what he or she thinks the superior wishes to hear. The more levels there are in the hierarchy, the more distorted the message becomes until, in the extreme, it bears no relationship to the original. Our society, being hierarchical and complex (= multilayered) is chronically subject to these failings.

So what we have experienced since the 18th century is the ability to vastly ratchet up economies of scale primarily because of improvements in the technology of iron and steel, and an exponential decline in the cost of the metal and therefore of things made of it, like vast buildings and ships. The pre-modern wooden technologies undergirded the Mediaeval state one solution, the new iron and steel technologies undergirded the Modern one.

Two very significant aspects of the new state one solution are self-organizing management systems and information technology. They make it possible to achieve a given level of productivity at much lower levels of output than before. They also make possible economies of scope, the ability to adapt much faster to environmental threat or economic opportunity. And they make it possible to cut out layers in the hierarchy, reducing noise in communication from bottom to top, thus making it more efficient.

Canada is a society built on giantism – giant railways, giant primary processing plants, giant hydo electric plants, giant canals, giant roads. The old state one paradigm is built right into it most important existing economic infrastructures. It will require a giant mental adjustment to think in terms of smaller scales appropriate to a sustainable economy in the Information Era. Take the example of the electrical power system. It is built around giant coal, oil and uranium generating plants designed to obtain minimum production costs by achieving maximum scale economies. This in turn means that an enormous distribution system had to be built to connect them to customers. All of this will become a stranded asset as solar and especially fuel cell technology begins to produce power within each home or industrial plant at total system costs (i.e. including distribution) which is competitive with the centralized system, as they undoubtedly will. We will have to abandon enormous infrastructures long before their physical life is up. The owners of those infrastructures will lose out eventually, but in between times they will put up a tremendous fight to protect them.
Great size in economic terms confers great power. The business organizations of the Modern Era have wielded immense power. For the first hundred years of the Industrial Era that power was mostly unchecked and the consequence was the industrialists seized control of the political agenda. It also meant an ability to commandeer the vast majority of a society’s income and wealth. Income distribution became enormously uneven and living standards for most people fell precipitously. Not until the craft unions established themselves beginning in the 1840s and governments started to legislate safer working conditions and restrict the use of child labour at about the same time, did real wages start to climb. Real wages really started to grow when governments introduced anti-competes legislation, regulating monopolies and other restraints on competition in the last quarter of the 19th century and the early 20th. Businesses chase their own bottom line not the greatest social good.

The emergence of transnational corporations able to seek the lowest common standards of social control threatens to return us to the experience of the first hundred years. What stands in their way is the very cheapness and therefore ubiqity of the new technology. In the 18th century the new textile machines and the factories which housed them were enormously expensive. Ordinary people just couldn’t get into the game. Computer communications technology, however, is cheap and getting cheaper all the time and attains very high levels of productivity on very small scales. The manufacturer of chips, computing machines and network devices requires enormous capital investments so it is difficult for a new entrant to get in the game. But at the applications end and in software engineering this is not the case because PCs, peripherals and connectivity are so cheap. It is a battle between economies of scope and economies of scale. Scale economies will only win if governments fail to police the market place for monopolistic practices, or, indeed encourage them. This does not mean that there will not be an increase in concentration in information industries as the current flight of technologies normalizes and competition becomes more about costs of production and marketing for fairly standardized products and less about innovation of new products, a trend which will start to occur within a decade or two (as it has in every technology cycle from the 1760s to the present). But it does mean that the era of giantism is behind and, moreover, if the concentration takes the shape of small producer networks or cooperatives, as it has done in the Emiglia Romana province of Italy, for example, and as it did on the Prairies with the producer cooperatives at the beginning of this century, it will be concentration of a very different kind. It will be regionally focused within nations rather than transnational. Its motivation will be social rather than financial, that is, about the maintenance of a local quality of life in which egalitarianism is an important value, rather than about maximizing profits for anonymous share holders and the aggrandizement of professional managers. Which route we go will depend on the social choices we make.

Modernization and the Industrialization of the Third World

Modernization in the Third World is being accompanied by industrialization, as happened in Europe two hundred years ago. This is shifting the geographical location of production and the relative wealth of nations and their political influence. In 1960 the United States accounted for 33.4 per cent of world production; by 2000 it will probably account for about 20 per cent. Over the same period Japan will go from 2.8 per cent to 11.9 per cent, East Asia from 0.5 per cent to 1.6 per cent, and Brazil from 1.6 per cent to 3.4 per cent.
At the same time as the Third World is modernizing we are, under the General Agreement on Tariffs and Trade, making trade with Third World countries freer. Just as importantly, under the Multinational Agreement on Investment, we are seeking to make investments in other countries as secure as possible and capital therefore extremely free to move. At the same time again, the Second World (the ex Communist countries), is opening up to investment and trade. The consequence of this is that 4 billion people have been added to the traded world economy.

This is a double edged sword. On the one hand 4 billion people represents a huge market for Bombardier aeroplanes and subway cars and Northern Telecom switchgear and on the other it represents a huge competitive threat in industries of the old economy such as autos and clothing. In such a huge market one can always find a niche, but that is dependent on our abilities in design (to differentiate products) which are threadbare.

Threats are also rapidly emerging even in the high tech sector. India has the largest software industry in the world in terms of numbers of people employed. Right now they are mere assembly line writers of code for Western companies, but that won’t always be so. India turns out more university graduates per year than we do. The rapidity with which Taiwan and Singapore developed expertise and export industries in the high tech sector should give pause to people who argue that globalization is a one way street going our way, because we will maintain our lead in high tech. Even in high tech, the low wages of the Second and Third Worlds, combined with the MAI and the ease with which technical know how can travel, mean that while we may do the design, and manufacture the high tech components (which is highly technology and capital intensive), the assembly will be done elsewhere. Our wages are almost fifty times higher than wages in South East Asian countries like Vietnam. Even the manufacture of high tech components will move offshore if our tax rates and capital incentive programs are too far out of line with those of developing countries. Even the design component could move if the large numbers of Third World students who are graduating every year from American technical colleges like Caltech and MIT and going to work in American laboratories decide at some point to go home or are made unwelcome. (They are a large and increasing proportion of the numbers of students studying science and engineering in the United States.)

We have to face up to the fact that these countries can turn out technicians as competent as our own but pay them a fraction of what we do. Indian programmers are paid just a few thousand dollars a year yet they are highly competent – they wrote much of the computer code for the Soviet space program. To maintain our edge in high tech we must turn out the people who create new technology and new product, that is, creative technicians and scientists. The focus must be on expanding our comparative advantage in creating new knowledge, such as biotechnology. What is important here is not only that our universities have a lead as producers of knowledge but also that all important lab technique can only be learned in a mentor relationship with a master.

All of this means that we face a tremendous social crisis. People in our population with secure home lives and high cognitive and affective skills will have a secure economic future. Those who don’t won’t. Perhaps half of the labour force. Some will find work serving the needs of the high tech elite, mostly in service industries. In order for Canada to remain an egalitarian, pluralistic democracy we will have to
become serious about making it possible for every child to have a secure home life and an enriching and mind expanding educational experience of the kind we have already discussed.

We have to recognise that cognitive and affective abilities are qualities subject to the normal curve, that is, that when it comes to innate abilities there will always be within any population the group under the left hand tail with below average abilities. The size of that group is undoubtedly smaller than the conventional measure of intelligence, the IQ test, would indicate. A broader definition of intelligence along the lines Howard Gardner has suggested would find a great many people who do not perform well on IQ tests, which measure (imperfectly) verbal and logico-mathematical skills, but who perform well on scales which measure other aspects of intelligence such as interpersonal and intrapersonal skills, which will be just as important as verbal and logico-mathematical skills in the information economy because of its emphasis on people in general and people working together collegially in particular. Improved educational methods along the Gardner model and equitable access to education can undoubtedly raise a substantial proportion of the people under the left hand tail to levels of competence which will make them creators of businesses or employable in the New Economy. Equally undoubtedly not all can be and this may represent a very large number of people which a society which claims to be an inclusive, participatory democracy cannot just leave by the wayside. Part of the answer may lie in the emerging economic strategy of improving the quality of life in our communities as the means to attract and retain New Economy businesses. This strategy will create new jobs and businesses and non government organizations – everything from home services for seniors to theatre and recreational groups. Many of the quality of life factors are provided by volunteers and volunteer organizations. Citizen participation also requires volunteers who provide the legs for local informal organizations. To support the required level of volunteer involvement will require the implementation of a guaranteed annual income or negative income tax.

Developing a comparative advantage in humanistic educational technology is one of the few comparative advantages we can have for the foreseeable future. Second and Third World countries and even countries like Japan are at a disadvantage here. They have a degree of social control and an insistence on social conformance which is inimical to individual creative excellence (the very factor which meant that the Industrial Revolution began in England and not somewhere else). In Japan there is a common expression, “The nail that sticks up gets hammered down”, meaning anyone who does not fit the norm is punished. This severely inhibits expression of individuality which is a key ingredient of original creativity. Whenever the Japanese have tried to push the boundaries of a technology as in the Fifth Generation Computer Project or in biotechnology, they have failed abysmally. The Japanese high tech managers know they have a problem. I have sat and listened to the head of research at a major high tech company and a senior bureaucrat at MITI argue heatedly about this chink in Japan’s armour for over an hour at a luncheon at the Tokyo Club.

Another Achilles heel of Japan is that there is nothing between the family and the state in terms of social organization. There are no Elks Clubs or United Church Women or Knights of Columbus. They have no Third Sector. They thus have a very poor soft infrastructure, so important for creating quality of life in the community. This is true of all the Asian Tigers also. Our having the Third Sector is another comparative advantage in economic development in the information era.
Outside of the New Economy we have nothing left but exporting raw resources, a business which is dominated by foreign corporations and in which technological innovation has severely eroded the numbers of jobs available per ton of material exported. Increasing the value added of those resources by turning them into manufactured goods is of course possible, but given the wage disadvantage compared with the Second and Third Worlds, this is a viable long term alternative only if we can strongly differentiate those products through design and marketing. Which brings us back to the educational system again.

We have great advantages in computing and telecommunications power – and the capacity to put it in the hands of most of the population. For all the prospect of low earth orbit satellite systems bringing instant communications to all parts of the world and the rate at which the cost of computing power has fallen, the fact remains that on a purchasing power parity basis, computing and telecommunications power in the Second and Third Worlds is very expensive. It is the other side of the cheap wage coin. People on wages one fiftieth of ours cannot afford $2,000 computers or $35 per month for Internet connectivity. We need to lever up on this advantage to make most of our population not only computer literate but to enable them to access information and education at a level never before contemplated, let alone possible. A fundamental aspect of any strategy here must be a high wage policy which ensures that Canadian citizens can afford to buy information technology and services. There is nothing new here. It was the basic business strategy of Henry Ford to provide high wage jobs so that people could afford to buy his automobiles. It was, in other words, a basic aspect of the paradigm of consumer based economic development we have been pursuing for the past seventy years or more.

Modernism and Sustainability: Entropy and the Second Law of Thermodynamics

Classical science doesn’t help us come to grips with environmental problems, in fact, by expanding the power of our technology it has accentuated the tendency of human cultures to undermine the capacity of their environmental niche to support them by overharvesting. Neoclassical economics, which derives directly from classical science also is unable to help because integral to the whole model is the assumption that consumption of raw resources can be limitless. It does this by not contemplating it – consumption and production are closed loops in the neoclassical model – unconnected to the environment either in terms of wastes or of raw inputs.

One part of post classical science that does help is thermodynamics, developed the mid 19th century but never integrated with the main body of science because its implications run so contrary to it. The Second Law of Thermodynamics suggests that we cannot take more from the world than solar insolation brings to it, that every effort to bring order to a part of the world by the consumption of energy and materials inevitably means an increase in disorder in another part, in the form of waste heat, pollution and environmental degradation. It suggests that there are physical limits to progress, even if distant to this generation of humans in the West. Exploitation of natural resources on the present scale has a price which our grandchildren will pay, a price which can be avoided by cooperating with nature, recognising that the biosphere, for all our scientific and technical brilliance, ultimately governs the future of Man.
The Laws of Thermodynamics (there are two) can be stated very concisely. The total energy content of the universe is constant and the total entropy is continually increasing. The total energy content of the universe was fixed when it was created. We can use energy, but in the process, it is not destroyed, it merely assumes a different form. When a piece of coal is burned in a steam engine, no energy is lost, it is transformed into heat which dissipates into the environment. That is the First Law – energy can neither be created nor destroyed. You will notice that in the transformation from coal to waste heat, the energy becomes dissipated. It moves from a concentrated to a diffuse form. Put another way, it moves from an ordered to a disordered state. Both these statements describe entropy – the tendency of the universe to evolve from an ordered to a disordered state. It and they are the consequence of the Second Law which states that whenever energy is used to do work a certain proportion is lost and is unrecoverable for future work. When the coal is burned the ashes and waste heat cannot be recombined into coals and made available once again to make work in a steam engine. Once the fossil fuels are used, that is it, we can’t wait millions of years for nature to reconstitute them. When the fossil fuels run out we must live within the energy budget provided on a daily basis by the sun.

Moreover, we may not even get that far before entropy pulls us up short, for the entropy (wastes, pollution, environmental disorder) of a high rate of use of fossil fuels may make the biosphere unliveable for us long before they are all used up. This is the meaning of the greenhouse effect, a natural process accentuated by the enormous amounts of carbon gases our use of fossil fuels releases into the atmosphere. It may cause us to curtail use of carbon fuels within decades even though several hundred years supply of coal, for example, may remain. Moreover, the non-linearity of a complex system like the earth’s climate offers the possibility (likelihood ?) that we could perturb the biosphere so much that it could flip into a whole new regime much less favourable to our future on earth (like an ice age).

What plants and animals do is to create local pools of low entropy, which are themselves, by using the free energy available to them in the environment. This free energy is ultimately provided by solar insolation. Algae and plants through photosynthesis use sunlight to build ordered carbon structures which are the free energy for all other forms of life, directly (in the case of herbivores) and indirectly (in the case of carnivores). Free energy is also available in the form of fossil fuels, which, according to conventional theory, are sunlight which reached the earth millions of years ago and has been stored as dead plants and animals in mineral form.

Some notion of the scale of entropy created by one human being can be gauged by examining the food chain upon which that human being depends. Consider biologist G. Tyler Miller’s chain of grass, grasshoppers, frogs, trout and humans. “Three hundred trout are required to support one man for a year. The trout in turn must consume 90,000 frogs that must consume 27 million grasshoppers that live off one thousand tons of grass.” At each stage of this chain only 10 to 20 per cent of the energy provided by the death of one species survives to be eaten by the next species in the chain. 80 to 90 per cent of the free energy available at each level is lost to the environment as wastes. In Miller’s illustrative example, it takes the energy stored in one thousand tons of grass to sustain one man for one year. That is a measure of the entropy or wastage in sustaining a single human being on a high protein diet where each man employs only his own muscle energy of one tenth of a horsepower. When he consumes thousands of horsepower as each industrial man does, the level of entropy is enormously greater. When
1 billion people out of the 4 billion world population live an industrial life we observe the level of disorder around us now. Should 2 billion or more of the 8 billion population of 2050 become industrialized, we might well wonder at the sustainability of the industrial way of life if not the human species.

It is important to recognise that technology does not release us from this snare. The problem of an unsustainable industrial burden on the biosphere does not go away with fusion energy, for example, if it means it is used to continue the expansion of entropic industrial and agricultural processes. More energy use, of whatever form, means more entropy. We may reduce entropy in the form of carbon gases by switching to fusion, but the second Law tells us it will pop up in some other form. We will have changed the form of the problem, but not the problem itself. In practical terms, it will not slow felling of the tropical forests or the rate of topsoil erosion or the rate of desertification due to over grazing. Quite the reverse, by sustaining or increasing material economic production it will sustain or increase these processes. It may reduce entropy in the industrial part of the world, but it will be at the expense of accelerating it elsewhere. The only way to significantly reduce entropy is to switch from economies which maximize the flow through of free energy to economies which maximize the life expectancies of stocks of energy and materials whether they be coal or houses or people. That is, the population problem means that sooner or later we will have to make our economies sustainable by keeping the level of disorder they create within the capacity of the planet’s ecosystems to remedy.

Modernism and Climate

One significant aspect of the story of Modernism is that it has occurred during a period of rising global temperatures which had beneficial effects on agricultural productivity and disease patterns. The late Mediaeval and early Modern periods experienced a significantly cooler climate than we have enjoyed for the past two hundred years. It is only in the past two decades that we have been able to estimate temperature over long periods of time and have come to recognize this fact. Based on these records we have been able to confirm a model which explains these long trends and can in fact predict ice ages. All of this has ben obscured by the excitement generated by the possibility of a man-made green house effect.

The story is basically the following. In recent years drill cores from the world’s ice caps and the deep sea bottom have permitted climatologists to create a history of the earth’s climate going back tens of thousands of years. It has been discovered that variations of climate revealed in the cores correlate with the systematic effect on solar radiation reaching the earth’s surface of the tilt of the earth, it’s wobble around its axis and the rate at which the wobble precesses. This is because as the earth changes its attitude to the sun under the influence of these factors, the amount and location of solar insolation reaching the surface of the earth changes too. As the three factors alter in a predictable way over time which can be correlated with historical average temperatures, it is possible to predict long term future climate. On this basis we have passed the mid-point of the current interglacial climatic epoch and can expect average global temperatures to enter a long term declining trend. A cooling trend has been observable since about 1950 (the warm temperatures of the past few years notwithstanding). The
expansion of the desert regions over this period is consistent with this cooling as is the increasing variability of the weather in the northern hemisphere.

This trend should not be ignored. The global warming hypothesis is, in contrast, based on a minute amount of data and an enormous amount of supposition build into elaborate computer models which are inverted pyramids standing on precious little understanding of how global climate operates. To give one example, the North Atlantic Conveyor, a current which begins on the surface of the North Atlantic in the Denmark Strait and submerges as it flows south all the way to the Antarctic Ocean, carries enormous quantities of carbon dioxide with it to mix in the deep ocean. The Conveyor was only discovered a decade ago. It is so important that it is hypothesized that when an ice dam broke in the Great Lakes several million years ago, releasing an enormous quantity of fresh water into the North Atlantic, that the Conveyor stopped, prompting the Pleistocene warming episode. Our exploration of the deep oceans has only just begun. Already we have discovered the Conveyor. We have also discovered deep sea vents spewing super hot brine around which an abundance of previously unsuspected life exist in an ecology that is based on anaerobic bacteria feeding on sulphur compounds. This is a wholly new and unexpected ecology which has called into question current theories of the origin of life which fix on aerobic bacteria in merely warm surface waters. What else remains to be discovered? Moreover, the models are so sensitive to initial assumptions that they lead as frequently to predictions of ice age as they do to periods of great warmth (remember Ed Lorenz).

Changes in climatic regime of this kind, though long unfolding, have pretty immediate effects. The damage to human societies comes not so much from the change in average temperatures as variability in annual weather patterns and the migrations of people and animals it sets in motion. The nature of the weather disturbances and the speed with which they follow the onset of the cooling trend, can be seen in the record of the Little Ice Age which commenced in Europe after the 13th century. The harvest failures and famines of the mid 14th century were caused by cold, wet springs and early fall frosts, rather than by lack of sun in the growing season. In China, by contrast, the cooling caused the monsoons to fail and drought and plagues of locusts to ensue. Moreover, it’s biggest impact came in the form of the Black Death, an outbreak of bubonic plague caused when the cooling climate dried out the steppelands of Asia. Humans and their sheep and horse herds were forced to migrate to find fodder and came into areas where the ground rodents which carry pastorella pestis, the bacterium which causes plague, are found (the highlands of Yunan). It is probable that the rodents migrated as well and that they and people transferred the bacterium to the rodents of the steppes. (We can hypothesize this from the historical records of the outbreak of plague in China in 1919). The great trading caravans, courier system and marching armies of the Mongol Empire, did the rest, carrying the bacterium into China and Europe. This is when the Mongols invade China and Russia. This macro parasitism of humans on humans brought destruction of shelter, theft of food and social breakdown which opened up populations to the microparasite. The role of macro parasitism (war) is emphasized by the fact that the plague made its first appearance in Europe during the Mongol siege of the Genoese trading town of Caffa (now Feodosia) on the Black Sea from whence it was taken by ship to Italy. Half the population of Europe died. That is climatic change at work on human populations – complexly. The biggest impact is indirect through a long, complex chain of causality. Not direct and obvious the way classical science assumes and the way
current climatologists think. They are concerned about failing crops and coastal cities being flooded because of a warming trend. The much more disastrous indirect impact via war and disease isn’t on their agenda.

We can no longer ignore natural cycles or the limits of natural systems. And we have to think about them as complex systems using Post Modern science if we are to understand them at all.

Canada’s Constitution and Charter of Rights and Freedoms as Modernist Documents

Canada’s Constitution and the Charter of Rights and Freedoms are profoundly Modernist documents. Indeed the very idea of a written constitution is a purely modern idea, originating with the philosophes of the 18th century. The US Constitution was the first.

The British North American Act of 1867, with amendments to 1982, when it was repatriated from Britain, legalizes an act of union between four colonies. In true Newtonian manner it lays out the mechanics of their government, but nothing more. It is a purely “how” document. There is nothing of “why”. This is true of all modern constitutions, so far as I know. The US Constitution does make a value statement in the form of truths self-evident to its framers, where the highest value is human happiness, but it nowhere defines that happiness.

The BNA Act reflects the concerns of a governing elite and a highly restricted electorate in today’s terms, a governing elite which in Upper Canada was indistinguishable from the business elite. It was thickly populated by politicians, cabinet members and premiers who simultaneously were board members of corporations and executives of railway and finance companies with a direct pecuniary interest in the major government funded or subsidized infrastructure of the day. Sir John A. Macdonald, Canada’s first Prime Minister was a prime example, no pun intended, being on the board of a large insurance company (which no doubt invested in CPR stock).

Those concerns included the bankruptcy of Upper Canada due to subsidies and guarantees for railways. This in itself was a major problem, as it meant that the government of Upper Canada was basically insolvent. But it also meant another problem, there were no public funds to embark on the next, logical step in railway development, a railway to the West. They also included a British Government consumed by Gladstonian frugality and retreat from Empire and a British capital market which would not extend credit without a more solid revenue base to support it. And finally they included fears of a jingoistic and militarized United States taking over the very Western lands necessary for the next phase of railway development. In the Maritimes it was a matter of economic decline as the Second Industrial Revolution undermined their carrying trade in wooden sailing ships and straightforward blackmail by the British who, through their colonial governors, made no bones about where they stood and threatened to withdraw the British fleet which was all that stood between the Maritime fishing industry and an American fleet intent on fishing in Maritime waters.

It was, in short, a very pragmatic, shot gun marriage between economic elites which, parenthetically, gave Lower Canada the opportunity to obtain a legal separation from a previous shot gun marriage with
Upper Canada in 1840 by which the British had sought to assimilate them. This was no democratic coming together of free peoples.

The BNA Act defines a type of representative democracy, shaped by the facts of 19th century transportation and communications technologies and a fear of the mob engendered in elites by the experience of the French Revolution, all reinforced by the desire of ruling elites to remain ruling elites (the reasons why 17th century elites in England and 18th century elites in the United States opted for representative rather than participatory forms of democracy). It takes no account of the competence of modern populations or the capacities of contemporary transportation and communication technologies.

Its implicit values of “peace, order and good government” are those of an elite ruling class, anxious to achieve a social stability within which to launch their ambitions of a transcontinental railway without protest or hindrance from a subservient working populace, not of a pluralistic, democratic society seeking civil and social equality, respect for differences, a peaceful life in harmony with the natural world and responsible world citizenship. They echo the colonial past not an independent future in a multilateral world.

It assumes the same dialectical, adversarial, rational debate we inherited from Plato. It takes no account of contemporary techniques of decision making based on consensus building and creative exploration of alternative approaches (Edward de Bono and all that). It spends its time in partisan, zero sum approaches to solving problems rather than collegial identification and pursuit of positive sum opportunities for new departures. It can be likened to raising a child by telling it no instead of leading it to yes. It is a negative feedback system rather than positive. In this it is Newtonian and Modern – seeking equilibrium through negative feedback rather than creatively riding the positive feedback of disequilibrium states to more hopeful futures, which would be Post Newtonian and therefore Post Modern.

The Charter of Rights and Freedoms, added as a Schedule in 1982, is a pure 18th century defence of the individual against the powers of the state. It could have been written by Hume or Jefferson (the drafter of American self evident truths). There is not a line about the individual’s responsibilities and obligations to community.

If we are to rewrite the Canadian Constitution we will have to synergize the individual values and aspirations of an increasingly Post Modern population with the realities of state and community in a Post Modern world.

Le Defi Mondial (The Global Challenge)

What this tour d’horizon of Modernism reveals is that we face a Defi Mondial (Global Challenge). Put in the simplest terms, it is the challenge of moving from a Modern to a Post Modern world. This movement is occurring on multiple levels. At the most fundamental level it involves a change in mythology for Westen culture from a mechanical, linear view of the universe to an organic, non-linear one. At the next level up it involves a change in social values which involves a rebalancing between objectivity and
measurability on the one hand and subjectivity and qualitative nature on the other and between outcomes and processes.

In economics it involves placing the person rather than the machine at the centre of concern, and quality of life rather than quantity of output; and from scientific management to self-organization, from the military hierarchy as the model for business to the family network; from comparative advantage based on resource and capital endowments to comparative advantage based on knowledgeable people, capacity for societal learning (from hard to soft infrastructure) and the quality of life in our communities; from a mechanical economic model sealed off from the natural environment to an organic economics which recognizes the Second Law of Thermodynamics.

In institutional organization it involves a shift from hierarchy to network. Hence in governance it involves a shift from corporativism to participatory democracy, from provincialism and regionalism to local government in the context of the nation state (disintermediation), thinking globally and acting locally, from hierarchy and patriarchy to network and collegiality. Vis a vis our relationship with the natural world it involves leaving go of the idea of nature out there (which leads to abuse and national parks for preserving wilderness and open season on everywhere else) to nature in here (where we responsibly consider our interrelatedness with nature everywhere).

It involves the evolution of a consciousness which integrates body and mind and spirit, cognition and emotion.

External factors such as change in weather, climate and ecological limits of entropic absorption are also involved and are accelerating and reinforcing these trends through what they draw our attention. For example, study of the weather led to the discovery of complexity; ecological limits impress upon us that we are part of nature, not apart from it and this reinforces our awareness of this aspect of Post Modern science so that it enters our everyday value system all the more quickly.

There are also factors internal to the development of modernism – a cognitively sophisticated and assertive population, a large minority of which are potentially self-actualizers; industrialization of the Third World, and information technology, which also reinforce and accelerate the other trends.

As with everything else, the Global Challenge is a complex system, with many parts each interacting with all the others.