Planning for Thrival and Thrivability in a Planetist 21st Century

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1. Introduction

During the last few years I have commenced using the 'thrival' in my work with clients. You won't find this word in any dictionary, and some of my colleagues who are linguistically precise do not approve my using it. However I use the word to make a particular point. We have a word survival to describe an aspirational goal but not 'thrival'. The lack of such a word says a lot about the lack of loftiness of the aspirations of English speaking people. I also use the word 'thrivability'. These words sum up the journey we need to make to transform ourselves for success in a globalising world , to aspire to thrive and to grow the ability to thrive.

By the year 2020 a new post PostModern paradigm will dominate. I call it Planetism. Planetism will shape the job categories, products and services and work organisations of the first quarter of 21st century. The values of Planetism will determine what is valuable. This will in turn determine early 21st century markets including labour markets. Children entering school today will graduate from tertiary education in about the year 2015. They will spend their whole lives in this Planetist world.

Today I want to talk about the changes which we need to make to ensure that we are best prepared, in both life and work, for success in this Planetist Future. Some of these are already happening, while others are not. These changes must occur in what people learn and how people learn. Administrators and planners will need to understand more deeply the nature of this world and the values and skills which will be needed for thrival in this world. Seventy percent of the job categories, products and services of the year 2020 have yet to be invented. Many of these will develop to transform the Modernist and PostModernist world of the 20th century into a Planetist world of the 21st century. If we are to seriously design our working environments for thrivability in a Planetist world we will need to develop and foster learning and innovation cultures in individuals and organisations. These learning and innovation cultures will be outlined. For success people will need to embrace the values of a Planetism, have grown their leadership capabilities, and are adherents of the learning and innovation cultures which are described in is paper, it is my view that they will have the tools of future thrival and thrivability. Organisations will also need

to be Planetists and recognise the importance of emerging dominant values such as communitarianism, interdependence and sustainability.

When young people ask me about career options for the future, they are almost always being forced to choose between existing job categories, many of which will not exist when they are in the middle of their working lives. Many others say I have to study something that will give me a practical job at the end of my formal learning period. In a world that is so rapidly changing this is absurd. If we are to create a high proportion of the 70% of the job categories which have not yet been invented here in Australia, we have to change the way we think about the present and plan for the future. Another thing I tell young people is to follow their passion rather than their pension. I ask them if they want to think about their future careers they must follow their destiny. Then the second challenge is to try to find ways to make income from these activities. They therefore must be job makers rather than merely job takers. Therefore they also must understand the difference between Leadership and Management. I now want to discuss management and leadership.

For a young person to aspire for thrival and to create thrivability, young people must become a Planetist, a leader, an innnovator and a continuing learner. The Planetist future will requires us to review the balance between individual and tip the balance toward community .

2. The Planetist Future: The Emerging Spaceship Culture

There are three major global forces which are shaping our future. These forces can be described in three core words: Globalisation, Tribalisation and Technological Change.

As we approach the threshold to a new millennium, we are witnessing the birth of a new planetary culture. The Earth is becoming more interdependent and cooperative. This new planetary culture is being moulded by a combination of political, economic, technological and ecological forces of great power which are all working synergistically to create it. My grandparents grew up identifying themselves with Western Australia and New South Wales rather than Australia. My grandchildren will identify themselves with their planet as much as their nation.

To illustrate the magnitude of the changes, consider these three historic processes which dominated global politics in the mid 1990s

A global trading system is being born through the GATT Uruguay Round and the World Trade Organisation (WTO). The first stage is now complete. In the next few years further agreements to ensure that international trade does not reward traders who plunder the environment and exploit labour will be enacted through the WTO. The WTO is now discussing the drafting of rules to prevent nations and companies from gaining an economic or trade advantage through the exploitation of human labour or despoiling or inadequately protecting the environment are now being negotiated will be agreed to in the next few years.

It is certain that the reaction to the international financial destabilisation caused by hedge funds in mid 1998 is a significant reason why the negotiation of the MAI was postponed but not abandoned. The need for complete global financial reform has

never been greater. The newly interdependent global financial system is vulnerable to pirate actions such as those by hedge funds, just as a just-in-time interdependent manufacturing system is vulnerable to a strike, act of terrorism or natural disaster. The more interdependent the system is, the more efficient it is, but the more vulnerable it is also to sabotage, piracy, or natural disaster. There is now a recognition is that a much bigger agenda of reform of the worlds financial system is now necessary. At the end of 1998, it was clear to most of the world's leadership that a total restructuring of the global financial system is necessary. This would become the first total rethink of the system since the Breton Woods conference in the last months of World War 2. A new global financial agreement which will guide the development the global financial system for the first decades of the interdependent 21st century will be negotiated in the next five years, and is likely to begin operating about 2005 or even earlier. This new negotiation will encompass all the issues which were components of the now postponed MAI (Multilateral Agreement on Investment) negotiations. It will also provide guidelines for the management of short term capital transfers such as those initiated by hedge funds, it will ensure the protection of labor rights and environmental protection, it will provide rules for the prevention/containment of corrupt behaviour by people involved in capital transfers including politicians in capital recipient countries. Some short term transfers of capital which have nothing to do with wealth creation in recipient countries but a lot to do with the wealth creation of the currency speculators will be either banned, or rigidly controlled and heavily taxed .The new financial arrangements which will be negotiated in the next few years will define the limits of national sovereignty in the 21st century, which is really the balance between national government individualism and global communitarianism, between independence and interdependence. These are only parts of the rapidly evolving infrastructure of international trade and economic cooperation which is creating a single planetary wide market place. The small business transnational corporation , which would have been impossible a decade ago ,is a reality today. Anybody who creates a new product or service will want to market it all over the world, not just into a small domestic market.

A new International Criminal Court is being formed. It first will concentrate on providing a venue to try people who commit crimes against humanity. In the near future other categories of crimes will be will be added, such as crimes against nature.

At the same time, a new planetary environmental order is being realised through the Montreal Protocol (relating to the phasing out of ozone-depleting substances), and the outcomes of the 1992 Earth Summit, including the Conventions on Climate Change and Biodiversity, and subsequent meetings such as the recent Climate Change Summit in Kyoto. New International agreements on environmental matters are being added to global administrative infrastructure every year.

The World is also being united by ecologically driven fear - fear of global ecological disaster. For centuries fear has divided humanity. Now it is beginning to unite it. Fear, traditionally a force which prevents change and reform, is now becoming a major factor in encouraging cooperation, change and reform. The fear of unpredictable climatic change and an ozone-depleted atmosphere is forcing people to think 40 years ahead, and to cooperate on an unprecedented level.

Finally, a new planetary security system is also struggling into existence. In 1946, Australia's Foreign Minister, H. V. Evatt, played a leading role in the development of a United Nations Charter which gave the United Nations the responsibility of playing the role of both planetary peacemaker and peacekeeper. The Cold War prevented the United Nations playing the peacemaker role totally, and severely restricted its peacekeeping role. Machinery to permit the UN to fully play these roles have yet to be established. Meanwhile, the UN has started to act in an *ad hoc* way. The UN's rather inadequate performance thus far will improve, as permanent peacemaking and peacekeeping machinery is put into place. The failure of the world to come to deal adequately with the ugly realities of Bosnia , Kosovo, Rwanda,and East Timor will reinforce the need for the creation of effective global peace-making machinery. In more recent times the world disapproval of the SLORC regime in Myanmar (Burma) and the Military dictatorship in Nigeria should be noted. Both are developing global pariah status.

Despite the resistance and difficulties which each of these three historic changes is facing, all are likely to be consolidated and in place by the end of the first decade of the 21st century. These three global agendas are major contributors to the creation of a planetary society.

At the same time the European Community is being formed. Soon it will invite Eastern Europe to join it. The rise of national fervour in Eastern Europe and Western Europe in such places as Catalonia, Scotland and Chechnya is related to the break up of the old security arrangements formed in the Cold War. This is not a disintegration of Europe, as some people have maintained, but a painful breakdown of old arrangements before the formation of new ones. The Slovenias and Latvias of Europe have recently shifted from a status of dependence to that of independence. In the next few years they will seek to become part of an integrated European Community, just as Luxembourg has been for many years. They will soon be followed by the Catalonias, Scotlands and Chechnyas. Soon the last will be added to by Makulu, Aceh and Irian Jaya as the Indonesian (Javanese) empire breaks up, and by Tibet as the first stresses are placed on the Chinese (Han) empire. It is important to remember which side global public opinion is on is these conflicts.

In North America, economic union is also coming. The leaders of the USA, Canada and Mexico have signed the North America Free Trade Agreement (NAFTA), which is the first stage of a single economic community, "from Alaska to Argentina" which will be completed by 2005 at the latest. In South America the Mercusor Agreement creating a common market between Brazil, Argentina, Paraguay and Uruguay has begun its operations. In our own region, the Bogor Declaration in 1994 committed the APEC region to complete economic and trade integration by 2020.

At the opening of the Atlanta Olympics there were 197 nations present. Fourteen of them were not present in Barcelona, just 4 years earlier. They were countries such as Slovakia, Slovenia and Moldova. Chechnya will be present in sydney. This illustrates the simultaneous tribalisation as well as globalisation of the planet. With tribalisation come increased reverence for cultural/ethnic diversity. By 2020 there will likely be about 300 members of the UN, most of them tribal states locked into global and regional interdependence.

For more than a century, a continuous process of globalisation and internationalisation has been under way. During this time, people have transferred their primary loyalties from their town or city to their region or state, and finally, to their nation. In the 1990s, the final step to the development of a new planetary culture, the transfer of primary loyalties from nation to planet, will begin.

These globalisation/tribalised forces are being added to and encouraged by the forces of technological change. Information and communications technology is building a single, highly networked world. By the end of the century everyone on Earth will be able to witness, and to a degree participate in, a single event somewhere on the Earth's surface. Space separation and time zones no longer prevent people working together. Teleconferencing, e-mail, multi-media workstations and faxes are only some of the new tools of planetary cooperation and dialogue. New computer software is now assisting cooperative dialogue and decision-making independent of space and time. One of the biggest areas for innovation in information technology in the 1990s will be work which uses information and communications technology for cooperative and collaborative work, including work where participants are separated in space and time.

The Internet connects millions of people around the world. It provides them with electronic mail, a news service, remote computer access, remote database access, and many newer services. We are evolving towards *cyberspace*, a word and concept coined by William Gibson in his science fiction classic, *Neuromancer*.

The Internet is now becoming a major factor in trade and commerce. This has led to the creation of a new phenomenon: the small business transnational corporation. It is now possible to have a small business in a country town and trade directly with your customers all over the world, without interference from governments of "middle men". All one must be able to do is to market a product or service which is sufficiently special that people in other countries want to buy it.

We are hearing and sharing the same news around the world by the courtesy of modern technology, and it reminds us that we share one small and vulnerable planet. A Minamata, Chernobyl or *Exxon Valdez* catastrophe reminds us of this shared fate and responsibility, even if we do not appear to be directly affected. We know more about what is going on all over the planet than ever before. John Donne's famous Devotion of the year 1620, has never been more true.

No man is an Island, entire of itself;
Every man is part of the continent, a part of the main;
If a clod be washed away by the sea,
Europe is the less, as well as if a promontory were,
As well as if a manor of thy friends or of thine own were;
Any man's death diminishes me, because I am involved in Mankind;
And therefore never send to know for whom the bell tolls;
It tolls for thee.

John Donne, 'Devotions upon Emergent Occasions' XVII

From Modernism to Planetism

In 1967 Kenneth Boulding wrote a famous essay called *The Economics of the Coming Spaceship Earth* and in 1969 Buckminster Fuller wrote a book entitled *Operating Manual for Spaceship Earth*. Both authors drew on the metaphor of the Apollo Mission, and particularly the famous picture taken from Apollo 8 which showed the beautiful, blue and white, fragile Earth against a lifeless moonscape in the foreground. Just after the near disaster of Apollo 13, which was the subject of a recent film, the then Secretary-General of the United Nations, U Thant used the metaphor of the Apollo Mission that nearly ended in disaster to promote the 1972 Stockholm Conference on the Human Environment, indicating that the whole planet was indeed in the situation of Apollo 13.

The dominant paradigm of the 20th century has been *Modernism*. This is so deeply entrenched that we have taken it for granted. *Modernism* meant the triumph of the western european way over everything else. It crushed cultural diversity through the forces of colonialism, religious evangelism and the power of western science and technology. A component of *Modernism* has been the concept of *progress*, which for most of this century has been something which we felt we shouldn't or couldn't stop. As the century proceeded, the attitude accompanying the utterance that "we can't stop progress" changed from unbridled enthusiasm in the 1950s to increasing scepticism, even cynicism and sarcasm, in the 1970s. By the 1980s, we needed to modify *Modernism*, as its dark side had become too significant to ignore, so we invented *Post Modernism*, in which we borrowed deconstructed parts of previous eras and built them into the new. We had recognised that some forms of progress involved throwing out babies with bath water. However, most of these additions were superficial, as the functionality did not change. We recognised that modern ideas and *Modernism* and their basis in western thinking and science and technology, did not hold all the answers. Therefore we began to listen and to learn about the wisdom of indigenous people ,the very people we has been hell bent on crushing, and we borrowed ideas from the East and incorporated them into our Western mandates. In the last decade, we have even tried to create a new synthesis of theology and science — something which would have been inconceivable in the Modernist era *PostModernism* is the process to reconstruct *Modernism* into something more appropriate to a globalised tribalised planet, and for creating a new paradigm which will consolidate in the early 21st century. I call the new and coming paradigm *Planetism*.

Kenneth Boulding introduced the idea that the Earth needed to change from a "cowboy economy to a "spaceship economy " if life on the planet was to survive.Today at the mid point of the 1990s humanity is mid way through a transition between what can be recognised as a disappearing *Cowboy Culture* and an emerging *Spaceship Culture* in the 21st century. We now recognise the Cowboy Culture as an unsustainable society and the Spaceship Culture as a sustainable society. The *Cowboy* and *Spaceship* Cultures have the following characteristics:.

The Cowboy Culture/Modernism (1960)	**The Spaceship Culture/Planetism (2020)**
Individualism	Communitarianism
Independence	Interdependence
Autocracy	Democracy
Humanity against nature	Humanity part of nature
Unsustainable production &	Sustainable production & consumption

consumption	
Patriarchy	Gender Equality
Intercultural & interreligious intolerance	Intercultural & interreligious tolerance
Conflict resolution thru confrontation	Conflict resolution thru negotiation
Reliance on Defence	Reliance on Security

The journey from the shoot out at OK Corral and life on the frontier, to negotiated sustainable living in the Spaceship is a metaphor used to describe the journey humanity is already making and will most likely be completed by about the year 2025. By the mid 1990s it was already clear that communitarian cultures such as Japan, Korea and Germany were achieving greater economic success in the new global economic environment than individualistic Anglo Celtic cultures such as the UK, USA and Australia. This will still be the outcome despite the current and temporary set backs caused by their failure to reform their financial sectors fora globalised interdependent planet. This is partly because their core cultures were more compatible with the emerging interconnected interdependent world of the 21st century.

The 19th century was the century of dependence, most of us lived in colonies. The story of the 20th century has been one of independence. The last European empires, the Russian and Serbian empires crumbled, and others such as China and Indonesia could follow. The story of the 21st century will be one of interdependence, living and collaborating on an networked planet. In the evolving spaceship. Spaceship *Culture* the 1990s the individualistic formulas which had produced success in the past no longer working as they used to. The word interdependence is a key word to describe our evolving just-in-time, environmentally sensitive society: interdependence between men and women, between tribes and nations, between enterprises, between employer and employee in our work places, and between humanity and nature.

In the case of the environment, the message of *Modernism* and progress was clear, even if it was rarely specifically stated. In the 1950s one did economically well by doing ecological ill: environment and development were incompatible, and to thrive we needed to exploit the environment and in most cases people as well. By the 1990s, we were aiming to do economically well by doing ecological good, or at least while being environmentally benign. Now we wish to utilise the environment, sustainably. One consequence of interdependence is that a global company can no longer build a clean plant in Indiana and a dirty one in India. We can't poison those of lower socio-economic status, for while doing it we poison ourselves. Not to create a sustainable society in the 21st century would threaten all of us, for we share a common future. In terms of the environment, we recognised that much which was desirable, even essential, for future and present well being was being obliterated by progress and by the dark side of *Modernism.*

Many of the new industries and enterprises of the early 21st century will design and innovate the products services and technologies to transform the world's peoples from cowboys into cosmonauts.

I am sure that most of you would regard yourselves as committed cosmonauts. However you might like to reflect on the culture of your work organisation, and whether it is similarly cosmonaut. If it isn't you might gain some insight into some of the frustration associated with your work . All of us, and particularly leaders need to understand the future of values if

we are to understand the markets of the 21st century and what customers will ask of you or anybody else. Values will define what people find valuable and what people find valuable will determine markets and what people will want to buy and sell. I now want to talk about the future of values.

The issues of globalisation, tribalisation and technological change all have huge implications for health and wellbeing. Globalisation is creating a more interconnected and interdependent world and this has big implications for example for the transmission of disease from human to human and from other species to humans. Tribalisation is emphasising the richness of cultural diversity. Difference cultures have approached health and wellbeing in very different ways and in the PostModernist late 20th century it is the non Western approaches that are being adopted as widely in developed countries as Western approaches are being adopted in developed countries.

The world's religions have been slow to recognise this extraordinary shift. The world religions seem to be splitting in two: into a progressive part, which is moving into the 21st century , and a reactionary part which is in a state of future shock, and which wants to return to the 19th century or even earlier. .

Religious fundamentalists are religious cowboys who still believe in patriarchy, authoritarianism and even killing in the name of religion. The world's religions are like everyone else, they are divided between adherents of the cowboy culture and adherents of the spaceship culture. For example the battles over issues such the ordination of women represent a major challenge to church cowboy patriarchy. Therefore we have two kinds of religions on the planet, dominated by what I call religious cowboys, the fundamentalists who are seeking a return to the security of the past and the religious cosmonauts who are seeking to adapt religion to the emerging nature of the 21st century..

Equally Tribalism is developing in two streams, what we can call Cowboy Tribalism and Cosmonaut Tribalism. In a place such as Bosnia we have the two living side by side, but it is the Cowboy Tribalists who are doing the damage and it is the emerging Cosmonaut majorities in the developed world who are seeking to place Cosmonaut order and tolerance on these Cowboy Tribalists.

The emergence of the spaceship culture is advantaging women. I believe this is one of the main reasons girls are now outperforming boys in schools. They were massively disadvantaged in the Cowboy culture, but they are more at home than men in the emerging Spaceship Culture. Feminists, who until recently, have focussed on the development of gender equity and on moving women from dependence to independence, are now beginning to move on to interdependence, at least in those part of the planet where the Spaceship culture is already beginning to dominate. In the remainder of the Planet which is still dominated by the cowboy culture, women are still in as much trouble as they ever were, they are still caught in the web of dependence ..

The transformation of our society of the last 20 years from one which promoted individual rights over community rights has changed to the point were community rights are now seen to be more important than individual rights. The battles in the 1990s over smoking in public and gun ownership are just two manifestations of this battle between community and individual rights. The community has won in each case but not without bitter conflict between the community and some defenders of individual rights.

The gun control debate is continuing to focus our attention on the issue of community violence. In reality it is my view that the world is actually not more violent, but thanks to technology, its capacity to do damage has increased immensely. In the cowboy days, the enemy tribe lived in another territory and tried to take our land by force, he came over the hill with guns blazing. Defence is the form of protection for a cowboy era. Now the enemy might live amongst us, a fellow passenger on the spaceship. We are now moving from an era of defending the territory from invasion (ie defence) to protecting ourselves from threats from within (ie security).

3. New Industries for the Planetist Future

I already have said that 70% of the job categories, products and service for the year 2020 have yet to be invented. What follows is a scenario set in the year 2010 which outlines some of the emerging industries of the 21st century. A large proportion of these are required to create a planet of Cosmonauts and a Spaceship Culture. They emphasis elements such as ecological sustainability and humanity as part of nature, and finding the means for creating intercultural tolerance and the celebration of cultural diversity in an interdependent tribalised and globalised planet.

The year is 2010.

In the 1990s Australia's industrial restructuring policies concentrated on making the mostly mature industries of the 20th century more efficient and internationally competitive, through changes to work organisation and culture, the introduction of advanced technology, and the downsizing of the work force. There was no clear policy designed to establish the new industries to furnish products and services for the markets of 2010 and beyond. Meanwhile the education system continued to develop the talents and skills of the most educated generation of Australians even for jobs which were not there. However in 2001 a new policy was initiated: policy was directed to establishing in Australia many of the newer industries which were beginning to emerge to service these future markets. Australia is now a global leader in some of these industries. As a result unemployment in 2010 is not the problem many predicted in the 1990s that it would be. These new industries collectively provided the products and services needed for the creation of a sustainable society, a spaceship culture.They included.:

Industries and technologies which improve the knowledge and capabilities of individuals and organisations.

By the year 2020, the *Human Development Industrial sector* will become the single biggest industrial sector of all. The sum of all activities which increase human knowledge and capabilities is now bigger than both the natural resource-based and manufacturing industrial sectors. The development of learning and innovation cultures in organisations is already demanding significant attention from organisational leadership and this will increase even further . This sector utilises modern technology such as multimedia, cybertechnology and cyberware. It includes a *Mindware Industry* based on the integration of cognitive psychology, mindscience based on Asian philosophies and practices such Buddhism, Taoism and Yoga, physiology and biochemistry, learning theory, artificial intelligence and information and communications technology. Information technology (IT) has been replaced by Knowledge Technology (KT) and Wisdom Technology (WT) In the 1990s it had already been recognised that there is a hierarchy in conceptual thinking, namely:

- Data
- Information
- Knowledge
- Wisdom

Data plus purpose becomes information. Information plus culture becomes knowledge. The same piece of information in a Japanese head and a French head becomes different knowledge. Knowledge plus experience becomes wisdom**.** I believe learning is the way we turn data and information into knowledge and wisdom.

The success of individuals and organisations is now determined by the capacity to effectively marshall knowledge and wisdom. In the 1990s, when a talented employee left an organisation, the information stayed behind on the organisation's computers, but the knowledge and wisdom walked out the door with the employee. Therefore as workforce turnover increased and short term contracts increased, organisations in the 1990s increasingly lacked a capacity to retain high quality organisational memory. This fact has led to the creation of markets for KT and WT. KT and WT have also revolutionalised learning. The Expert systems of 10 years ago represented the first generation of KT and WT. Data plus purpose is information. Information plus culture is knowledge. Knowledge plus experience is wisdom.

Now hardware and software are being designed by cognitive scientists, artists, philosophers and people drawn from a diverse range of backgrounds, as well as engineers . Mindware, KT and WT, together with the development of virtual reality technology to create new modes of experiential learning, is now the basis of a new generation of Learning Technologies.

Industries which create sustainable modes of development, production and consumption.

The journey towards creating a Sustainable Society on the Planet, which is needed for a Spaceship Culture, is now well under way. A number of new industries were created over the last decade or so to help its realisation. These include :

The *Earth Repair Industry* which restores and rehabilitates degraded, polluted or even totally obliterated ecosystems such as rainforests, coral reefs and rangelands, and their soil, water and biotic components when they have been degraded by development such as mining or by over-exploitation. It also rehabilitates degraded and contaminated urban areas, and polluted lakes and rivers, seas and airsheds.

The *Environmental Survey Industry* assesses, monitors and audits ecosystems.This industry works from the macro level (such as from space through the use of remote sensing), through to micro and nano levels (eg surveying contamination at molecular levels) The industry provides instant and detailed information and management knowledge relating to forests, fisheries, wildlife and other biota, and the management of atmosphere, seas and fresh water resources, and soil and land.

The *Resource Renewal Industry* which is dedicated to working towards the complete elimination of waste. In nature there is no waste. One species' waste is

another's food. This industry facilitates the reduction in use, and the reuse and recycling of resources and the management of wastes. It seeks to turn all *waste into food*.

The *Sustainable Energy Industry* researches, develops and markets those energy products, services and technologies which are based on the utilisation of renewable resources, and continuously improves energy conservation and efficiency. Its aim is that, by about the year 2020 all major processes *will be able to operate within the energy limits posed by solar income*. It also aims to steadily increase the proportion of energy drawn from renewable resources and conserve energy use.

The *Sustainable Communities and Cities* Industry involves the design of sustainable communities including the evaluation of the basic health and well being needs of people living in urban areas. A guiding science for this industry is human ecology. This integrates the work of the architectural, building, industrial design and planning professions in the design and construction of sustainable schools, shopping centres, transport systems, homes and the like.

The *Clean/Green Food* Industry produces and processes food ,from both dry land and irrigation agriculture. Clean means that food is uncontaminated by toxic substances pesticides or radioactive materials , while green means that it produced in ecologically sustainable ways. The industry utilises mineral fertilisers and natural soil nutrient cycles (biodynamic or organic production modes), and reuses and recycles waste products such as garbage and sewerage. It efficiently uses, reuses and restores water. It also emphasises the use of sustainable processes in the production, processing, transport, storage and consumption of food.

Industries which promote intercultural harmony and personal wellbeing

The combined forces of globalisation and tribalisation, mean that the worlds's cultures are increasingly becoming both interlinked and interdependent, while at the same time they are celebrating their tribal differences and needing to coexist peacefully. To achieve an ultimate spaceship culture, the world of the 21st century needs ways of achieving individual wellbeing with a minimisation of stressful living, intercultural harmony through increasing intercultural knowledge and understanding, and ways to peacefully resolve conflict.

The Intercultural Comfort Industry helps us to trade across an increasingly culturally diverse world . It devises products and services including language, art and culture exchange, education and learning, and sport to make cultures more comfortable with each other and respectful of differences. It also involves the cultural customisation of products and services such as food. Australian food exports are not culturally customised for a large number of different cultures.

The *Mediation/conflict resolution Industry* operates in areas of conflict between nations and tribes down to conflicts in workplaces and families. As many conflicts are due to religious differences, religious organisations have become heavily involved in this field.

The *Wellbeing* Industry facilitates the creation of health rather than the treatment of illness and the development of inner journeys. This is achieved by a multicultural integration of a wide variety of approaches to promote wellbeing. These include

mineral spring resorts, the utilisation of Yoga, Meditation T'ai Chi Chuan, Tae Kwon Do, Counselling and many other systems of human renewal and development, and various forms of recreation and enjoyment centres such as surfing, bushwalking golf and equestrian sports. It integrates western medicine with alternative approaches such as Ayuvedya, Shiatsu, Acupuncture, Chinese Traditional Medicine, indigenous medicine and a wide number of cultural approaches to healing and the creation of Wellbeing. The aim of the Wellbeing industry is to empower people to effectively create their own personal wellbeing, to deal with drugs and to generally deal with distress and stress which are often a causal agent of conflict

The *Security Industry* in the 1990s began to replaced the old *Defence Industry .* The concept of *Defence* was based on the concept that our enemies lived in other territories and would seek to conquer us by force. This was a piece of the old *cowboy culture*. In the emerging *spaceship culture* of today we recognised that the enemy is likely to be somebody with evil intent who lives amongst us; those who blow up buildings in terrorist raids and place poison in subways in Japan. The concept of security involves not only military security, but also security of food production, security from environmental hazards and catastrophe, and security from the espionage of intellectual property. The cowboy form of response to a threat is the Grozny solution, destroying a whole city and killing many innocent people to punish a few evil Chechens. The Spaceship security response is the smart bomb, which aims to destroy the evil people but not wreck the whole town , or the neutron bomb which destroy a people but does not wreck the spaceship itself. The industry involves the assessment of, and planning for, risk.

The *Home Services Industry* allows financially poor, time-rich people to provide services to financially rich, time-poor people. Like land, time is something we cannot make more of. Therefore busy (and well off) people, improve their own wellbeing by buying more home services from others and are therefore able to spend more time with their loved ones. They are able to make a single phone call to an agent and have a wide variety of home services provided. These include childminding, gardening, home repairs and maintenance, cooking, caring for pets and so on. The agent then invoices the client on a monthly basis for the wide variety of services provided.

Two other industries which support these other industries are:

A *Smart Components* or *Smart Parts* Industry which manufactures intelligent components based on a synthesis of information, advanced materials and micro- and nano-technologies. This industry provides components for a wide variety of industries. As robots are merely combinations of smart components, this has since become the robotics industry.

The *Contract Research and Development Industry* and the related *Professional Services Industry*. Australian intellectual resources, including those in universities and in the public sector research laboratories are used to investigate problems - under contract - for corporations and institutions in Australia and in other countries. The *Professional Services Industry* in Australia provides services to Asian countries and elsewhere, including those of the integrating professions such as engineering, architecture, planning and industrial design, while at the same time assisting their development in Asian countries.

4. Preparing for Thrival in a Planetist Future: Management & Leadership

All of us are part leader, part manager. It is important that all people learn the difference between them and to utilise both of these roles in their lives, not just one of them. Australia is currently an overmanaged and underled country. It constantly puts managers in positions where leaders are needed. Many Australians fail to understand this critical difference between leadership and management. The first job of good leadership is the leadership of self. Therefore what I am now going to say, refers as much to how we plan our lives as it does to planning and responding to the world around us.

- Managers *respond to change* and problems, whilst leaders *envision , create and shape* change.
- Managers are concerned about doing the *thing right* , while leaders are concerned about doing the *right thing* .

- Managers reflect about *fate*. Managers reflect about *destiny*

Henry Ford said

"The whole secret of a successful life is to find out what is one's destiny to do, and then do it" "

Destiny has two qualities, what you are good at and what you love doing, it is about aptitude and passion. Most people leave school without having any real idea about these qualities because they have not been encouraged to look within. Fulfilling one's destiny is about growing your aptitude and passion in the context of emerging possibilities and opportunities. Destiny is different to fate. You might like top contemplate the difference between these. In Australia we contemplate fate too much and destiny not enough.

- Managers *control* , Leaders *facilitate*

- Managers work *in* the organisation, while leaders work *on* the organisation.

- Managers and Leaders also have different kinds of visions and ask different questions about the future.

The <u>manager</u> is most comfortable asking ask "What <u>will</u> the future of our community be. I call this the <u>Probable Future</u> question . In over managed and under led Australia it is the question most Australians are comfortable with.

An alternative question is "What <u>should</u> our community be like the year 2020 I call this the <u>Preferred Futures</u> question. It is the question <u>leaders</u> tend to ask. It is also the question that the average Korean, Japanese, Malaysian or Chinese will ask. It is the question for people who let their dreams play a role in how they think about the future.

You will appreciate that there is a big difference between these questions.

- Mangers are *Probable Futurists*, and contingency plan for *Prospective Futures*.. Leaders are Preferred Futurists contingency plan for *Possible Futures*.

What people who ask the probable future question are really indicating is that they have very little influence on the future of Australia. It is a fatalistic view, based on the thought that the future will just happen, and that one cannot shape the future, merely not get run over by it, or if one is smart, make a dollar out of it.

A second way people look at the future involves the process required to get there. The current approach of most people most of the time is a *Problem Centred* one. This is usually the way of the manager. This involves working towards a future where present problems are lessened or removed. The aim is to remove or lessen present "bads" from the future rather than positively create "goods". The alternative way is to take a *Mission Directed* approach to the future: to create “goods” in the future, to set out to create a positive future. This is the way of the leader. As it is with the imbalance between probable and preferred futures, there is an imbalance between Problem Centred and Mission Directed approaches. The excessive weight given to Problem Centred approaches makes it very difficult to achieve anything like an optimal result. Again all of this involves using management skills where leadership skills are needed, or because we appoint managers to positions of leadership.

- Managers are *Problem Centred* people, Leaders are *Mission Directed* people

There are many other examples of imbalances between Problem Centred and Mission Directed approaches. The emphasis of medical approaches to health over health promotion is one, the emphasis on pollution control over pollution prevention is another. In the area of structural adjustment of our economy, most of the concentration goes to the Problem Centred *repairing the old* (modernising the existing industrial structure and infrastructures), rather than the Mission Directed *creating the new* (designing and building new industrial structures, industries and enterprises appropriate for the 21st century).

Many of the so-called economic and unemployment problems of Australia have neither economic causes nor economic solutions. They are cultural problems with economic, social, cultural and environmental consequences, and the solutions must be found at the cultural level. The biggest problem is the imbalance between Probable and Preferred Futures thinking, and between Problem Centred and Mission Directed approaches to the future.

People change their behaviour for two basic reasons: fear and hope, and their more extreme soul mates, desperation and inspiration. Fear and desperation are the tools used too often by the manager to create change. Hope and inspiration are the tools of the leader .

The leader uses the following process to create change: they develop vision, which is used to create hope, hope is used to create inspiration, and inspiration is used to create commitment .

This is what Goethe said about commitment.

Until one is committed, there is hesitancy, the chance to draw back, always ineffectiveness. Concerning all acts of initiative, there is one elementary truth the ignorance of which kills countless ideas and splendid plans: that the moment one definitely commits oneself, then Providence moves too... Whatever you can do or dream you can, begin it,. Boldness has genius, power and magic in it. Begin it now

If young people enter adulthood after being given the opportunity to grow their leadership capabilities as well as their management capabilities they will be able to first determine their own destinies and shape their own future in a changing world where government's are less important, but communities and individuals are more important.

The core qualities of leadership:the eight Cs:

Leadership involves what I call 'neck down' components including the heart, as well as the intellect The leader embodies six qualities which come from the heart rather than the head. The leader should be:

- *confident*: having self belief but without hubris.
- *courageous*: going where others dare not, overcoming self interested opposition.
- *committed*: doing what must be done, being assertive not aggressive.
- *considerate*: listening and responding to the opinions and views of others.
- *courteous* : showing respect in conversation.
- *compassionate* : responding with empathy to victims and the disadvantaged.

Management on the other hand is largely 'neck up', an intellectual exercise. It does not seek to engage the emotions in work. To these six C's we can add two more Cs which are necessary for effective leadership. This is the ability to:

- *conciliate***:** building and nurturing interdependence and relationships by facilitating compromises which realise win-win outcomes in negotiations.
- *communicate***:** articulating with both head and heart, ensuring both non verbal and verbal forms of expression convey the same message. Leadership therefore embodies eight qualities and capabilities: confidence, courage, commitment, consideration, courtesy, compassion, compromise and communication.

The leader in action:The six Vs:

I have already mentioned the eight Cs of leadership—the internal characteristics of good leadership: confidence, courage, commitment, consideration, courtesy,

compassion, conciliation and communication. This is what the leader is. However it is also the performance of a leader , what the leader does, which is equally critical. A leader who does not get results, or only gets them in ways which alienate the crew or undermine the long term capacity and capability of the crew, is a poor leader.

I want to describe the leader in action by using a metaphor: the leader as a commander of a spaceship leading a culturally diverse and interdependent crew on a mission to a chosen destination

The leader is the facilitator of mission-directed/preferred-future strategies, of mission building. The critical components of mission building are:

- Vision
- Values
- Virtues
- Venturers
- Voyages
- Vehicles

*Vision***:** this involves choosing one's destination. The first task is to develop the preferred future destination: 'Where do we want to go and when do we want to get there?' The journey is being made in an environment of change that is driven by both external processes and internal mindsets and behaviours. The second task is to understand and recognise that the spacecraft is already journeying to the probable future, which will be the destination if current trends ('business as usual') are pursued and an alternative destination is not chosen. The leader will also recognise, however, that the leader and the crew are not omnipotent and do not have unlimited resources. Although the leader will undertake measures to improve organisational capacity (financial resources available) and capabilities (human resources available), it may not be possible to achieve the preferred futures goal within the required time-frame. The leader and crew might, therefore, need to select a possible future destination based on a recognition of limitations imposed by the capacities and capabilities as well as by the competition.

*Values***:** this involves asking the questions of 'What are the shared beliefs of the crew?' and 'What are the rules which determine how the crew behaves and relates to one another during the mission?' Some of these values will be desirable for the completion of the mission and some will not be desirable It is important that the leader and the crew explore the core values (both desirable and undesirable) which define the ethos of the crew and the rules which govern relationships between crew members and between the crew and the external world. For example,'tall poppyism ', "cargo cultism" or "cultural cringism" would not be desirable. Without a clear understanding of shared values, a culture of mutual trust and interdependence will not develop between the crew members,

and commitment by the crew to the realisation of the mission will not follow. The crew and leader should examine core values (both desirable and undesirable) and develop strategies to nurture the desirable ones and transform the undesirable into more desirable Before a crew can determine what virtues it will actually practice, it must first determine what its core beliefs are and assess them in terms of both ethics and performance. Values which undermine or elevate ethical behaviour or which will diminish or improve performance, should be specifically identified . Then strategies for nurturing the desirable and transforming the undesirable would then become part of the capability building strategy to be discussed below under 'Vehicles'..It is the role of the leader to stretch and challenge values which are no longer appropriate for future needs or which are undermining desirable transformations in behaviour, and to advocate value shifts which can enhance future thrivability. A leader who merely reflects current values, or even a time warp of past ones, and encourages people to be " relaxed and comfortable" with them , such as Australian Prime Minister John Howard will not earn respect. People know that rapid change is always challenging and stretching values and that know they need guidance making value shifts which necessary. They know it is a delusion to sit comfortably holding on to old and dated value systems in a rapidly changing world. The leader must challenge and stretch value systems.

*Virtues***:** these are desirable values that are practised unquestioningly and automatically. They must be desirable and appropriate for the development of a successful mission. Behaviour can be perceived by others but inner beliefs cannot be seen; other people cannot see one's values but they can see one's virtues. Virtues involves behaviour rather than beliefs. It is possible that a leader can harbour an undesirable value such as racism, but this is not of consequence unless this value influences the leader's behaviour. Virtues are values which are actually practiced: even if they are not believed. It is important to take core desirable values and ensure that these become practised virtues. The leader must be a practicing exemplar of organisational virtues. A leader who does not "walk the talk" or "practice what the leader preaches" will earn disrespect. This is the flaw of President Clinton : he is a good leader in terms of the seven C's but is not virtuous: he fails in practice. The leader must be an practitioner/advocate of these virtues, and work to ensure that desirable values become practiced virtues and undesirable values remain unpractised. In the context of ensuring prosperity and thrivability in the twenty-first century these virtues should include the values of Planetism.

*Venturers***:** answer the question 'Who will participate in the mission or support the purposes of our mission as allies?' People change behaviour or direction or commit themselves to undertaking a mission for two basic reasons: fear and hope. Fear is the tool of the manager and is over-used; it undermines trust. The creation of an environment of hope is the major tool of the leader. Provided there is trust, vision leads to hope, and hope leads to inspiration. Inspiration will lead to the making of a commitment to the mission. Commitment comes from the heart not from the head, therefore the leader must be able to move the hearts of his crew and this, in turn, delivers the energy required for commitment. The head

then comes into the commitment process by bringing intelligence to assess the wisdom of making a commitment. So both head and heart are involved. Management involves the head but not the heart. It is therefore not surprising that the majority of mission statements developed by management gather dust on shelves. They have been developed without an attempt to gain the commitment which comes from the heart.

The leader should promote a climate of organisational interdependence between venturers. There are two particularly important group of venturers who are critical to the success of any mission. The first group consists of *champions* who are the 'true believers' among the crew, the most strongly committed to the mission and those who will try to ensure other crew members become equally committed. The second group of venturers are external to the crew but are equally committed to the mission. These are *allies* of the mission who are committed to working towards the same or a similar destination. They will provide external support**,** intelligence and knowledge and wisdom for the mission. They are also a group who have vested interests in the mission and can be used to counteract vested interests against the mission who might try to stop it or slow it down.

*Voyages***:** involve asking the question 'What course should the spaceship take and through what environment ?' Many events occur during the voyage. Futurists often use a process called 'backcasting'. This process describes a journey into the future but it is written as a history from the perspective of the future. It is the opposite of forecasting which identifies major events and their timing and weaves them into a narrative. In this 'Future History' of the voyage there are three kinds of events: obstacles, deeds and heritages. They are described in the past tense as events which have occurred and are being detailed after the mission is completed:

- *obstacle**s*** are constraints and barriers which stopped, slowed down or side-tracked the mission and which were overcome. Descriptor words which can be used include reduce, abolish, overcome, annul, cancel, negate, retard and extinguish;

- *initiative**s*** are new infrastructures and actions which were developed and implemented , and qualities, opportunities and facilities which were created during the mission. The descriptor words include establish, initiate, organise, found, increase, encourage, achieve, attain, negotiate and elevate.

- *improvement**s*** are the changes we make to existing infrastructure, qualities, facilities and opportunities to improve performance and outcomes. Descriptor words include improve, redesign, renew, revitalise, better, enhance, enrich, amplify, fortify and strengthen.

- *heritage**s*** are priceless elements and qualities relating to the mission, the crew and its culture which must be nurtured and treasured during the mission and for the future. We need to do this so that we do not throw out babies with bath water while we are changing everything else. Descriptor words include protect, defend, nourish, enhance, bolster, support, care for and sustain.

Vehicles: involve answering the question 'Which vehicle(s) do we use to reach our destination?' To answer the question we must decide the means by which the mission will be achieved, including the development of new innovations to provide those means. Many of the means will already exist, but it would be foolish to assume that they are all that will be available to the crew. New means will be created in order to realise the mission and these, in turn, will create new opportunities. The Apollo mission, for example, led to the creation of many new innovations. One of the most exciting aspects of mission building is to recognise that mission building is a process of design and innovation. There are two kinds of innovation:

- there are innovations to the crew itself. These are called *capacities* and *capabilities*. They serve to improve the ability of the crew and their allies to complete the mission. Capacities refer to additional resources such as financial and technological resources which are identified and utilised to improve the success of the mission. Capabilities involve improving the human resources element, the skills, knowledge and experience of the crew, so that the crew—both as individuals and as a collective—are able to perform at a higher level. A combination of improving capacity and capability will assist the crew to arrive at the *preferred future* destination, or to move a *possible future* destination closer to a *preferred future* destination. The development and maintenance of learning and innovation cultures are important factors relating to capacities and capabilities. Without these cultures the crew will not have the capability to renew and reinvent itself, to adapt, to develop new tools, new means and new resources to fulfil the mission.

- there are innovations which need to develop to realise the mission. The two major vehicles are *ways* and *ware*. Ways includes the values, virtues, ethics, beliefs, paradigms, behavioural patterns, customer preferences and professional practices necessary to complete the mission. Many of these ways can be developed through learning and the most effective way to do this is to develop a learning culture. Ways can also be shaped or limited by laws which promote, permit or prohibit actions or things. Incentives and disincentives, both financial and non-financial, are other means of promoting appropriate ways and discouraging inappropriate ways. Ware includes designs, products, services and technologies which will be needed to realise the mission. The development of ware will be most successful if an innovation culture is nurtured. Different ways and ware can be developed for different strategic purposes and their development will provide opportunities for the innovative and enterprising. For example, the ways required to realise a sustainable future can be called 'green' ways, while the ware for the realisation of a sustainable future can be called 'green' ware. Likewise, we can have health ways and health ware, learning ways and learning ware, and so on.

The way of the leader therefore involves embodying the eight Cs internally and implementing the six Vs externally. It involves creating a climate of hope as the major causal agent of change, instead of utilising a climate of fear. It involves adopting mission-directed, preferred future strategies instead of problem-centred, probably future strategies, or the way of the manager. Those who thrive will be those who fully understand the opportunities provided by the change process

initiated by globalisation, tribalisation and technological change, how these trends will develop in the next few decades and who understand the nature of, and practice the values of, a Planetist future. However, they must also be leaders not managers. The world needs management and managers—but not as commanders of spaceships.

5. Reinventing Communities for Thrival and Thrivability in a Planetist Future.

The traditional ways of delivering social justice have been the social welfare programs of government and the bargaining power of trade unions. Both of these are slowly weakening. The nation state is being disempowered by globalisation , and this functional disempowerment will continue. With the exception of the United States, and possibly China and Japan, most individual governments cannot play a critical role in determining outcomes. The delivery of social justice is one of the major traditional roles of governments. The functional disempowerment of nation states is now limiting the ability of governments to protect its own people from becoming victims of globalisation. They are now not able to introduce a tariff barrier to protect a declining industrial base, except in a short- term way as part of a transitional arrangement .

Once we recognise that national governments are losing their capacity to deliver social justice it is incumbent on us to derive new mechanisms appropriate for the new conditions. Many of these will be based around community empowerment. While national governments are being disempowered by globalisation, communities and corporations are potentially becoming empowered. Whether this empowerment becomes real or remains potential, however, depends on the mindsets and skills of the corporations and communities themselves. Thus far corporations have been much more successful in reinventing themselves for success in an interdependent planetary society than have communities.

There is very little which can prevent a community from charting a new course in a globalised world if they decide to do this. Governments are no longer acting to discourage local self-help initiatives as they once did. The worst excesses which discouraged initiative such as the command economy, and some of the more extreme policies of the welfare state , are things of the past. These encouraged dependence, and discouraged independence and the chance to ever become interdependent. Governments will continue to be willing to be the catalyst of change , provide it does not engender long-term and open- ended commitment . This is the difference between helping out and handing out.

There are a number of steps which a community must take if it is to successfully reinvent itself for prosperity in the twenty-five century. The first step is to develop a vision, to consciously choose its future. The future is part chance part choice, and too many communities which are in decline have let the balance tip toward chance. Henry Ford's comment about destiny (chapter 3) is apposite. If rural and regional communities want to thrive in a generation's time, they must ensure that their strategic plans are more mission-directed, creating the new, and less problem-centred, repairing the old. Most of the job categories and products and services of the year 2020 have yet to be invented. There is no reason that many of these cannot be created first and best in disadvantaged communities if there is a mission to make this happen. In my work with rural communities in Australia over a number

of years, the development of a preferred-future strategic vision is quite easily undertaken. Creating a vision is the first step towards self-empowerment and self - realisation.

Rural communities, and many other disadvantaged communities as well, often tend to suffer from three mindsets which limit the ability of rural/communities to reinvent themselves. The first of these is the 'tall poppy' syndrome, the undermining of those people in the community who are the enterprising and the visionaries. The second of these is the 'colonial cringe', a belief that rural communities are not sufficiently sophisticated to provide or undertake high knowledge and skill components of the value adding stream. All too often they see themselves only as a commodity producer only. The final one is the 'cargo cult' syndrome, the belief that rescue from their predicaments will come from outside, rather than by self-help. They hope that 'the cavalry will arrive'.

A community committed to collective self-help can be most successful. I am involved with a new international not-for-profit foundation called the MyPlanet Foundation. This foundation is responsible for two new programs called MyTown and MyCountry. The goal of MyTown is to 'enable communities (or nations) to choose their future and thrive in an interdependent Planetary twenty-first century'. MyTown will work primarily with rural and regional communities to assist them to create and implement strategic visions for sustainable prosperity in the twenty-first century. MyTown will provide the envisioning and strategic planning tools on-line to enable communities to create this sustainable prosperity for themselves.

In envisioning its preferred-future the community makes choices about its future industrial base, and in the context of both its destiny and of the emerging twenty-first century planetist market place. To realise this preferred-future on the ground the community will need to collaborate with both governments and corporations. The role which governments can play in these processes is well understood. However the way which communities can realise their envisioned future though collaboration with private sector corporations requires some explanation. Globalisation is changing the potential roles of both governments and corporations. Governments are becoming become less influential and corporations more so.

In an era of globalisated relationships, the loyalty of customers to suppliers is lessening and is increasingly valued by a supplier. People have more choices about who can provide them with products and services, and are increasingly able to shop around for them, including on the Internet. In an era of open competition corporate enterprises are looking for long-term relationships with their suppliers and their customers: they are searching for more certainty in a less certain world. To respond to this challenge corporations want to enter long term commercial relationships with their customers and are willing to invest much more to obtain this kind of customer loyalty . The frequent flier programs of airlines are examples of this. Communities can now act as a single aggregated purchaser and negotiate with suppliers for goods and services, and for financial investment in their communities, in return for their loyalty. They get a better price and they provide a larger aggregate market for a supplier. A community which enters a long-term contract with a corporation as part of its strategic plan to help itself can create a strategic alliance, an interdependent relationship which is mutually beneficial. However to do this the community first needs to decide what it wants. It needs a shared vision of its future, and it can then

negotiate with corporations and the external world generally to obtain the means to realise its vision of the ground. The community operating as a single collective can enter the global trading system just as nations and individuals can.

In all communities a significant proportion of the income spent by the community, leaves it. Over time, this has tended to increase, and in rural communities a very high proportion of the community's financial resources is used to pay for products and services provided externally. When a local business closes and is replaced by a transnational, money which used to stay in the community leaves the community. Therefore over time the power of communities has tended to decrease as there has been a decline in the capacity of communities to decide how the capital resources they have created are expended. Over time, more and more money leaves the community, never to return. This financial 'leakage' has been a major factor in the decline of rural and regional communities.

A community which collectively develops a preferred-future vision and a strategic plan to realise this vision, can now implement policies to ensure that this leakage is minimised in order to increase its ability to finance it's own development, from it's own resources. In the MyTown initiative each community establishes a community development fund, which can then be used to finance the implementation of the strategy to realise its preferred-future vision. The community can collectively bargain with external providers of community services, in the same way a trade union bargains with an employer. In any community a significant proportion of the communities financial resources leaves the community as payment for services provided to that community. The community can restructure itself organisationally to minimise this 'leakage' and retain more of it's own money in the community. MyTown is providing expertise to show communities how to achieve this.

This process recognises the reality that the twenty-first century power will increasingly reside with communities and corporations, and less with governments. This is a completely different model to the traditional model whereby governments provide the machinery and finance for the provision of social justice. In chapter 8, I will be talking about another aspect of community empowerment wherein social welfare is not directed from government to individual welfare recipients but to the communities who provide social welfare rights through a program of mutual responsibility.

Typical of the questions which are asked of communities during the envisioning phase of MyTown are:

- The year is 2020, and this community is world famous for 'X'. 'X' is a product or service, unknown at the turn of the new century, which is now sold on world markets. What is 'X'?
- The year is 2020, and this community is now thriving. So much so that the most ambitious and best educated of its young now return to spend most of their lives in the community after some years away undertaking education and work experience. Name a quality, facility or opportunity which has been added to the community to make this difference.

Communities which get to the future first , and together, will become the successful communities in the 21st century. This process can work for communities in rich and poor countries alike, all kinds of communities including indigenous communities. It

can also work for whole nations, and this is the purpose of the MyCountry program.

There are many large transnational corporations who are willing to be involved in the MyTown and the MyCountry initiative. It is in their enlightened self interest to do so, and it also affirms their Planetist credentials. No government funding is needed for this model to work, but of course this is welcome. However the model for community development which is used is the one based on the twenty-first century reality of stronger communities and corporations, and weaker state and national governments.

Some communities will continue to blame governments for not coming to the rescue if nothing is done. This is because many people in rural areas and in disadvantaged groups continually believe that their sole pathway to social justice is through the redistributive role of government. Of course, some of this will and should continue but it is an unwise community to expect this as the major means of financing its reconstruction. Governments should be relied upon for topping up rather than for funding the basic program. Some will find it incredible that I am proposing that communities and corporations can work together to solve their problems, and even without the cooperation of the nation state. However, this is the reality of the emerging global society

While my comments have focused on rural and regional communities, they apply equally to indigenous communities or any community which is currently being disadvantaged. Community initiated programs, based on collective decision-making about their preferred-future, and collective bargaining with service providers, together with the development of community financial resources, including through the lessening of financial leakage, can provide the mechanism for the revitalisation of communities.

The programs which I have described for the revitalisation of communities can also work for disadvantaged nations as well. This is the purpose of the MyCountry program. Developing countries can bargain with the rest of the world in a similar manner. The process has been sucessfully trialled in Papua New Guinea. In my work there I assisted the government to develop a strategic preferred-future vision of itself in for the year 2020. This vision and strategic plan is called KUMUL 2020. In a globalised environment developed nations have the best opportunity to succeed if they seek to market their special qualities, their differences. As in communities, however it is important that preferred-future mission-directed mindsets predominate.

For too long we have considered that the world as being divided into rich countries and poor countries. In fact, many rich people live in poor countries and many poor people live in rich countries.. The significant difference is the proportion of these in various countries. In a globalising world where nations are becoming less significant and individuals, communities and corporations more significant, we must rethink our mindsets on this issue. This mistaken mindset about poor and rich countries reinforces the idea that the major source of redevelopment capital for poor countries should continue to be foreign aid and international capital. Of course this is a part of the equation, but it also ignores the fact that rich people in poor countries could and should be playing a much more significant role. As with communities the issue often is one of “leakage” of capital out of poor nations. Often the mechanisms do not exist to enable these people to reinvest in their own country. The old ways of

controlling the export of capital are now not possible in an open global capital markets. New means to prevent capital leakage must be found and a renegotiated Multilateral Agreement on Investment (MAI) should incorporate a new set of rules to achieved this. MyCountry aims to assist developing countries to minimise the leakage of their own financial resources, including promoting communitarian mechanisms to encourage local investors to invest more at home.

Some of the steps that all communities should take if they want to find sustainable prosperity in an era of globalisation, and at the same time contribute to the process of civilising globalisation, are:

- becoming Planetist first and collectively so that communities are able to understand the requirements of the Planetist market place, and create a thriving twenty-first century community. This requires that communities develop mission-directed strategies and that they are committed to 'creating the new and emerging' rather than 'propping up the old and declining'. Accepting assistance from governments or others which is aimed at propping up declining industries is, in essence, accepting a form of palliative care.
- consider their destiny: what they are good at (aptitude) and what they love doing (passion), and consider this destiny in terms of new emerging opportunities for the provision of products and services for Planetist markets. Insight should precede foresight.
- helping themselves by developing preferred-future visions based on the community's destiny and initiating, through the development of strategic action plans, new ways to fund their new initiatives, such as by the minimisation of the financial leakage from the community.
- installing high capacity connectivity, such as via the Internet, to connect their community with potential customers elsewhere who will be interested in their products and services, and with collaborators and allies who can help the community restructure itself . Ensure that this connectivity is available to all, irrespective of capacity to pay.
- seeking to grow the community's intellectual property in the areas which it has chosen to promote for its future success, by investing resources in research and development, and innovation in these areas of chosen excellence, so that the community can ensure that it remains an industry leader in these areas. Ensure that tertiary education programs are the best possible ones in terms of both quality and access. The education system should excel at nurturing the capabilities needed to realise the chosen industrial future. Each community should aim to ensure that new transnational organisations, which specialise in these same areas, are founded and incubated and that the leadership of these organisations remains based in the community. All organisations should nurture appropriate brand names and other ways of differentiating its products and services so they can maximise their chances of being a price maker, rather than a price taker in a globalised market place.
- continuously promoting leadership, learning and innovation. Communities should restructure their leadership from a traditional 'control' form to an 'empowering' form. In the "empowering" form, the traditional leadership adopts a mentoring/elderhood mode , and empowers the young and emerging leadership to assist the community to reinvent itself. This most effectively combines the wisdom of the old and the energy of the young. It is a form often used in

Japanese corporations to ensure that old leadership, which is naturally conservative, does not prevent innovation and the implementation of 'creating the new' strategies in the corporation. In rural and regional communities the leadership is often both conservative and closely tied to the old and declining industrial order. It often struggles to embrace a newer industrial order. As well as leadership, the other main cultural issue which needs attention is the promotion of learning and innovation cultures in the community. In particular, entrepreneurship should be promoted and affirmative action programs in these areas should be introduced for disadvantaged members of the community.

- encouraging the rich and successful to show greater loyalty and responsibility to their communities by investing more and providing mentoring to their own communities. Successful communities often have a culture of community philanthropy and community responsibility is upheld by the community's most successful members, including those who have become expatriates from the community and have become successful during their time of expatriation. In my work with communities I often suggest that the community invites its successful expatriates to return to the community as 'mentors in residence' for a few months to assist the community reinvent itself for future success.
- ensuring that the NGO sector which is the ethical and moral watchdog of the behaviour of the global trading system, and of social justice at the national and community level, is sufficiently empowered to be effective in this role. This includes community and global NGOs such as Greenpeace International , Amnesty International , Transparency International, religious social justice organisations, international aid NGOs and the like. This will ensure that new international institutions such as the international Criminal Court, and UN agencies are able to be more effective in their critical work. It will be NGOs who will increasingly provide the people who will oversee the work and development of the global system of governance. They can operate as they see fit, and are not constrained by the limitations posed by the consensus or 'least common denominator' based negotiations which constrain the effectiveness of negotiations between governments.

6.Preparing for Thrivability in a Planetist Future: A New Learning Culture

Adaptability and flexibility are the building blocks of individual and organisational survival at any time. If foresight—and particularly, preferred-future foresight—is added then one has a good chance of ensuring the people will thrive as well. However, what kind of foresight is necessary? In their book *Competing for the Future*, Gary Hamel and C. K. Prahalad make the point that an enterprise will be successful if it gets to the future first, and its best way of doing this is to be a faster and better learner than its competitors.. Therefore it is advantageous to learn well, learn quickly, and learn continuously.

One of the major roles of any envisioning process should be to envision in detail the emerging Planetist world and seek to define one's role in it. Everybody will need to change in some manner if they wish to thrive in this Planetist world. Many will even need to redefine and change their core business. Even the professions will need to change. In mid-1997 I was working with a group of pharmacists who were particularly concerned about the fact that the appearance of dispensing robots would make much of their current professional practice redundant. Pharmacists will need to reinvent their profession or it will cease to be one. Lawyers will need to come to grips with the

implications of the emergence of mission-directed law (mediation and conflict resolution) in their current problem-centred litigation-based profession. Medical specialists will need to understand the implications of mission-directed health creation for their problem-centred healing-based profession. Doctors are less highly regarded these days because people perceive them to be more concerned with treating illness than with creating health. Surveyors have endangered their professional future because they failed to embrace remote sensing , surveying from satellites, early and left it to others to capture this opportunity . Now they are trying to recover ground. If they more foresight,and were better learners and got to the future first, they could have embraced remote sensing early, and kept their profession viable and relevant. Dairy industries will need to respond to the emergence of vegetable protein, such as soy, as an alternative to their milk-based business. Pesticide makers will need to recognise the emergence of mission-directed prevention programs, such as genetically engineered plants, and their impact on their problem-centred core business of making poisons to kill unwanted insects. They can either reinvent their core business and innovate these genetically engineered plants themselves, or continue with their business as usual and allow somebody else to do it. The latter choice could result in extinction. Oil companies will need to be part of the emerging renewable sustainable energy and to decide whether their core business for the twenty-first century will be fossil-fuelled energy supply or renewable energy combined with the production of hydrocarbon-based materials production. In 1997 British Petroleum (BP) announced that it planned to make a commitment to the development of renewable energy. BP has the second biggest solar energy company in the world, but it will be interesting to see whether BP will have the courage and the mindsets to continue to invest in its long-term strategic mission rather than invest in solving emerging problems resulting from the fossil fuel energy side of the business. In all of these instances these organisations will need to turn their backs on some of their old cultures and learn new ways in order to reinvent themselves for success in the twenty-first century.

On the threshold of a Planetist world foresight will need to be directed at understanding the implications of the spaceship culture. Those who learn the ways of a cosmonaut will thrive and those who remain cowboys will not. Today's kindergarten children will complete their tertiary education in about the year 2015, when the spaceship culture will dominate.

The planning of education tends to be of the problem-centred/probable-future kind. It tends to accept existing trend projections and to create new roles for the education system while it attempts to solve emerging problems. If we are to design an education system most likely to guarantee success in a Planetist world and design ways of learning which will produce the most efficient and equitable learning outcomes, then we need to ask questions such as: 'What skills, knowledge and capabilities will an individual need in order to thrive in the spaceship culture?'; 'What kind of education system will endow an individual with the skills, knowledge and capabilities to thrive rather than merely survive in such a culture?'

It is hardly surprising that the education system is almost always out of date and in catch-up mode. More than any other activity, education is the way we prepare for the future. It is extraordinary that so little thought is given by educational planners to the nature of the world in which our children will spend their adult lives, that is, in the years beyond 2020. Most of the reform is directed to planning more efficient schools of the

present rather than preparing the students for the future. If there is one place we should think intergenerationally, it should be in our planning of education.

There are three reasons why education is the most important investment in the future and learning is the most powerful instrument for shaping the future. The first is the need for people and organisations to remain adaptable and to learn continually in order to thrive in a rapidly changing world. The second is the need to develop a knowledge-based or brain-powered economic and industrial system where prosperity will be determined not by what is found beneath the ground but by what is found between the ears. Knowledge is the key to wealth generation. The third reason is the need to maintain the use of the education system for creating a more equitable society. The biggest gift a person of low socio-economic status can receive is a good education and a continuing desire to learn. The biggest investment any nation can make to future prosperity is to ensure that all able people are creators of a twenty-first century society, rather than victims of it. It is astonishing that there are some people, including a few leaders and particularly in the United States in the late 1980s, who complain that the developed world is actually over-investing in education because there are too many educated people without jobs. Presumably they mean that the world would be better off if these jobless people were also uneducated. Such an astonishing utilitarian view of education and learning is, fortunately, now less fashionable.

Much educational planning is also based on problem-centred mindsets which use education as a response to deal with present problems of society and its institutions. There are some countries, such as South Korea and Malaysia, where education is seen as a component of the mission to create a preferred future for the country. In other countries, such as Australia and the United States, education is used by people to plan individual preferred futures but it is rarely used to create preferred community or national futures. This is another manifestation of the difference between the communitarianism of Malaysia and South Korea, and the individualism of the United States and Australia.

In countries such as Australia, each time a significant cultural, economic, social or environmental problem is recognised the education system has been asked to respond to that problem, usually by adding yet another component to an already overcrowded curriculum. This is an outcome of years of operating with a problem-centred approach and the accumulation of tasks given over time to the education system, of responding only when the system breaks down. The overcrowded curriculum has now become a nightmare for the people who plan and coordinate school curricula and timetables. As part of their work the Victorian secondary-school principals have visualised a new system for the year 2010, which emphasises learning throughout life and deinstitutionalised education. They have stopped using the word ‘school’ and started using ‘learning centre’ (LC) because ‘school’ suggests rather too much of the mass production and time conservation concept of an educational factory. The principals have created a vision of a learning centre in a greenfield site and devised ways to modify existing schools into LCs. The LC has a core set of buildings but education is carried out throughout the whole community by the use of modern technology and through the wide use of reality and virtual reality experiences to make learning more directly relevant. Students have a card which is called the ‘Educard’, a smart card in which educational rights are encoded including with appropriate levels of affirmative action for disadvantaged and disabled students. Students are able to use their Educard to acquire learning from a wide variety of sources, including from remote educational providers, through the Internet. After the years of puberty students are totally autonomous in

deciding what they learn, when, and how. The old ‘chalk and talk’ teacher has vanished and teachers and librarians have coalesced into a single pair of professions: the knowledge navigator and the mentor. The knowledge navigator guides the learner into the world of knowledge and wisdom, the mentor provides wise counsel to the student. The knowledge navigator and the mentor can be the same person or different persons. In addition, students have ‘peer support groups’ to encourage and aid their learning. The whole process of learning now takes place through a new model and pedagogy for learning which is called ‘the twenty-first century learning culture’.

Developing a Learning Culture

‘Life-long learning’ and ‘organisational learning’ have become buzzwords in the 1990s. It is recognised that both individuals and organisations must learn continuously in order to adapt to changing circumstances and to develop new skills and capabilities to thrive in a rapidly changing world. There is also recognition that any enterprise which seeks to be successful in the knowledge-based industrial system of the twenty-first century needs to be led and managed in ways which maximise organisational learning. This is increasingly so because as contract work grows rapid staff turnover can significantly undermine organisational memory.

However, life-long learning and organisational learning are only two facets of the learning culture which must be developed in the late 1990s. As part of my work with the Victorian principals I developed a pedagogy for a learning culture in collaboration with the learning consultant, Dr Julia Atkin. If learning is to be maximised a new model and pedagogy of learning—a new learning culture—is needed. This learning culture should contain eight elements:

- Life-long learning (LLL)
- Learner-driven learning (LDL)
- Just-in-time learning (JITL)
- Customised learning (CustL)
- Transformative learning (TL)
- Collaborative learning (CollL)
- Contextual learning (ContxL)
- Learning to learn (LTL)

Life-Long Learning (LLL)

The world’s education systems are slowly modifying what can be termed an ‘early-in-life’ or ‘front-end’ system of education into a life-long one. In the past, education in developed countries has been dedicated to teaching and learning during the first third of life, and in much of the rest of the world it has been for a ten-year period from the approximate age of five to fifteen years. With the exceptions of some continuing adult education for relatively few people, formal learning over the remaining two-thirds of life has been ignored. At present, countries such as Australia have a hybrid of the ‘early-in-life’ and ‘life-long’ systems, and the transformation has been largely problem-centred and ad hoc. There is no vision of the nature of a preferred life-long system of education which describes the essential ingredients of LLL systems, and where and how such systems differ from early-in-life systems.

Most formal learning has traditionally occurred in this early-in-life period of compulsory education. Under these circumstances learning could be force-fed into (often unwilling) educational customers. At the end of the twentieth century schools, together with hospitals and prisons, are remnant factories whose designs and operations are still dedicated to the time and motion studies of Frederick Winslow Taylor and the mass production of Henry Ford. Manufacturing has moved forward from 'economies of scale' to 'economies of scope'. Most schools have not..

Compulsory education developed at a time when most jobs were low-skilled and work places wanted docile, unquestioning takers of orders. It did not matter if students were so alienated by school that they vowed they would never expose themselves to the education system again. Now we are developing a rapidly changing, knowledge-based society, and this early-in-life learning is being replaced by life-long learning. Adult learners will not put up with the autocratic 'teacher-knows-best' form of education experienced by most of us in childhood and which, unfortunately, still persists in too many educational situations. A pedagogy is now needed to ensure that learning is enjoyable, or that the context of learning encourages students to persist with less enjoyable learning pathways. Life-long-learning facilitates flexible career paths, promotes adaptability and empowers the personal development required in a rapidly changing world.

The adoption of a full culture of life-long learning will have profound implications for what goes on in the primary and secondary education systems, which will need to change as much as work places have changed. If primary and secondary education systems are no longer required to provide the basic quantum of knowledge and expertise needed for the whole of life they will be relieved of a major burden that is stifling them. There will be no need for overcrowded curricula since people have the whole of life to learn and are not restricted to just a few learning years early in life. With a system of life-long learning no longer would it be necessary to pack into the years of formal schooling most of the knowledge that is needed for success in life.

What is important in an LLL system is that people leave formal education with their early childhood desire to be a life-long learner still intact. There should be a love of learning, and people should be capable of life-long learning because they have the skills such as literacy and numeracy to access knowledge. People should also have the confidence to be life-long learners. If all of these prerequisites for successful LLL were in place it would then be up to the continuing or further education system, both inside and outside the work place, to give people the opportunity to be life-long learners. If there is already a love of learning, a desire to learn and a capability and confidence to learn, then people will take the opportunities to learn when they are offered.

Much of our most important learning occurs before we go to school. Perhaps one could say that an important example of the denial of human rights is that children do not have the right to pick their own parents! Children who have parents who are poor teachers can be disadvantaged for life. Some formal education systems in other countries, such as a famous program in Missouri in the United States, are recognising this fact and are providing resources to assist parents to become more effective educators. Two-year-old children are natural learners; they cannot stop learning, their desire seems insatiable. For two-year-olds, learning is not only

essential it is also fun. However, by the time many children are halfway through secondary school all the pleasure of learning has vanished and with it much of the desire. Motivation has become driven by external factors such as exams rather than by curiosity. That is, the natural endowment of life-long learning has been converted into compulsory, early-in-life learning, which has killed much of the pleasure but, more importantly, kills the motivation to be a life-long learner. We should ensure that children arrive at school as enthusiastic, life-long learners driven by curiosity, and that they stay that way throughout their lives. When many children first arrive at school they are already showing symptoms of advantage or disadvantage which some never overcome, despite the efforts of the education system. In addition, schools spend large amounts of money on remedial education, much of which would be unnecessary if schools went into the homes in their communities and helped parents to become good teachers of their own children. A preventative program would produce net savings to the education system as well as providing a huge bonus for social and economic equity.
More effort and resources need to be spent on the early childhood stage to give all children an equal opportunity to become life-long learners and to overcome any disadvantages which may result from the different capacities parents have to be effective and inspiring teachers of their own children. Most parents want to give their children the best but their capacities to do so differ markedly. Teachers could visit families in their homes and help develop effective teaching skills in the parents. It is certain that the cost savings, both in remedial education and the gains to national income and equity, would be considerable.

People who currently 'fail' in the education system are the ones who currently suffer most in an era of rapid change. With a system of LLL they would have second and third chances to overcome this disadvantage. People should now be given the opportunity to develop their career and personal development paths (their future learning) by conscious choice and by negotiation with education providers.

Learner-Driven Learning (LDL**)**

In traditional schooling learning is initiated by teachers. The average 2-year-old's learning is driven by curiosity—by the need to know. Wherever possible, all learning should be made learner-initiated and learner-managed. Learner-driven learning (LDL) encourages independent learning which replaces the dependence of teacher-driven learning. Independent learners will then be able to become interdependent learners. Modern technology which allows the learner to use the Internet, the CD-ROM and a host of other educational tools now permits the learner to initiate and manage learning. The development of a system of LDL will transform the nature of teaching. Technology is making the old demarcation between teachers and librarians more and more blurred. In the next ten years or so it is likely that there will be an integration of the traditional roles of teacher and librarian into a single profession to assist learner-driven, life-long learners. This new professional, called a 'knowledge navigator', could assist learners to seek and find knowledge by gaining access to a wide variety of knowledge resources, and to enrich and affirm that knowledge and learning where appropriate. There is also another future role for the former teacher professional: as a mentor who is responsible for assisting and inspiring personal development.

LDL will also be assisted by the development of greater student autonomy. It is likely that a system—such as the 'Educard' and similar to a universal health insurance card—will give students the right to access learning from a wide variety of educational providers. The power of educational providers to control the education system is drawing to an end. From now on the customers, or the parents of very young customers, will have a greater say in shaping the education system. It is important that they do so because each learner must assume responsibility for their life-long learning. This means that they should choose what they learn, when they learn and how they learn. It is time for the education system to recognise this fact and to plan positively for an LDL educational system.

Just-In-Time Learning (JITL)

The average 2-year-old wants to learn immediately when seeking an answer to a question. This is curiosity-driven learning and it is the best way to learn. The concept of just-in-time (JIT) commenced in the manufacturing and retail sectors as an alternative method of production and operation which meant that enterprises did not need large stockpiles of all the components required for assembling a particular product. Components were sourced at a rate that was 'just in time' for the production. This is manufacturing interdependence. This concept should now be applied to education to ensure that learning mostly occurs when there is a high motivation to learn. Modern technology permits us to provide such a learning system. Educators and business now have both the responsibility and opportunity to create it. Just-in-time learning (JITL) has the capacity to reinforce both LLL and LDL. The net result of these changes will be that curiosity will again become a driving force for learning.

Customised Learning (CustL)

Just as people have preferences for using their left or right hands, so they learn and think in different ways depending on the part of the brain they prefer to use in their learning processes. People are different and so think and learn in different ways. Some are visphiles, some are audiophiles, some prefer to learn by right-brain processes and some prefer left-brain processes. There are quadrants in the brain and each is associated with particular learning processes. Dr Julia Atkin, the Australian education and learning specialist, has described the difference between the quadrants as: 'upper left'—learning by gaining information and facts; 'lower left'—learning by being able to do, acting out, applying; 'lower right'—learning by feeling emotions, experiencing and doing; 'upper right'—learning by making connections, understanding and insight.

While all of us use more than one quadrant and many of us use three or all four, we all prefer to use some quadrants more than others and we learn fastest by using our favoured ways of learning. These individual differences are not reflected in the way teaching and learning is conducted in schools. Our education system also does little to encourage us to develop whole-brain learning capabilities.

Because of the encapsulation of knowledge in the written word in the past education and learning have favoured people with preferred left-brain thinking and learning processes. Mark Twain once said: 'My education was only interrupted by my schooling'. It is likely that he was a right-brained learner and the book-driven

learning processes of the late nineteenth century favoured people who were left-brained learners. It is possible that there is an association between the increased dominance by left-brain processes in education, and particularly in learning from books, and the disappearance of the desire to learn in many young people, and with it the desire to be a life-long learner.

If right-brained thinkers are not successful in being appointed to senior positions in organisations, and this often occurs because people are chosen in the main according to their management skills, then the organisation will become over-managed and under-led. Vision is a product of right-brain processes. Organisations which do not encourage right-brained thinking will lack vision, therefore customising learning for all thinking preferences will_mean a better balance rather than the over-dominance of left-brained thinkers and processors which is found in organisations today. To get more organisational vision we need affirmative action for right-brained thinking.

With the disappearance of the desire to learn we lose a basic capacity to adapt in a modern, rapidly changing world. Failure to become literate or numerate ensures failure in a modern technological world. But this is likely to be at least a partial reflection of the fact that the current education system has tended to favour left-brain processors.

We all know stories of brilliant people who drop out of school because they could not or would not learn. In many cases the learning opportunities were totally unsuitable to their personal learning styles. Modern technology now enables the packaging of learning modules to suit people with different preferred styles, and learners can choose the way they wish to learn. Technology can provide learning pathways to suit individual learners who can select educational learning options most suited to their own personal learning pathways. Imagine an educational supermarket with many customised learning packages sitting on the shelves. Learner-driven learners choose the package appropriate for their preferred learning and thinking styles, and therefore are able to maximise their own learning. Thus modern technology can permit different learning and thinking preferences to be catered for, and for whole-brain thinking and learning to be promoted.

We also need to develop customised way to promote and maximise learning for people with different multiple intelligences. The classic work in the 1980s of Gardner introduced us to the fact that we have many different intelligences and are stronger in some than in others. These intelligences are: linguistic, logical-mathematical, musical, spatial, body-kinaesthetic, interpersonal and intrapersonal..

I will talk about the products we need to develop to realise this later on .

Transformative Learning (TL)

Learning should transform people and challenge and change belief systems and behavioural patterns to meet new needs and opportunities and to overcome disabilities and disadvantages. It is important that assessment systems be instituted which measure transformation as well as evaluate knowledge. The transformative component of learning is therefore critical in the world of rapid change. Often the word ‘re-training’ is used by politicians as the solution to the problem of a lack of

adaptability to change. Apart from the fact that the word ‘training’ is a totally inappropriate word, training is not what is needed: what is needed is learning, and continuous life-long, learner-driven, just-in-time and transformative learning. Training is a nineteenth-century concept which has passed its ‘use-by’ date. In the late twentieth century this concept of training might be suitable for dogs or even soldiers but it is not suitable for people who need to think for themselves in their work, and to continuously grow and transform themselves.

Collaborative Learning (CollL)

In recent years there has been an increasing emphasis on effective collaboration and team building. In the 1980s individualistic information technology dominated. In the 1990s collaborative forms of information technology are beginning to emerge as the world moves from individualism to communitarianism and from independence to interdependence. In the contemporary world it is impossible for anyone to know everything and the knowledge required for specialisation is too great for everyone to be able to know and understand more than a few complex issues. Certainly, modern technology means that we can seek to be very effective generalists and use sophisticated knowledge. However, we also need to be able to work in multi-disciplinary teams. This is a basic part of our emerging interdependent culture, and collaborative learning will become an increasingly important part of the learning culture. I have been involved with the development of a new Australian product called a ‘Grouputer’. The Grouputer is a single personal computer to which twelve keyboards can be attached in order to facilitate collaborative brainstorming and collective learning and decision-making. I use the Grouputer when I am working on collecting information for vision making. It is astonishing how powerful and synergistic collaborative learning and brainstorming can be.

Contextual Learning (ContxL)

Our experience tells us that learning is most effective if it occurs in an environment which makes the learning relevant to the experience and expectations of the learner. Learning has rarely occurred this way in schools of the twentieth century. Traditionally, learning was centred on promoting knowledge in ways that were often removed from using that knowledge in life. We used to sit in classrooms and be told about the nature of things. The best way of learning in context is to create an experiential situation which validates and affirms the learning. Modern technology has the capacity to create an awesome variety of virtual reality processes that can improve learning and emphasise learning by doing, learning by experimenting and learning by trying and failing. Learning can also go to appropriate places; for example, learning about animal liberation/vegetarianism could take place in an abattoir.

Learning To Learn

Until recently, if one assessed the time devoted to these educational activities the result seemed to assume that people did not need to learn how to learn and think. If people know more about how they learn they will be better placed to improve their thinking and learning capacities. All learners need to have the capability to understand how they think and learn and to develop their capacity in both of these fields. This will assist them to plan more effectively and drive their own learning. It

develops the capability in individuals and groups to understand and plan more effectively, to manage and realise their own learning.

Learning for the Jobs of the Future

I spend a great deal of time working with young people on their career options for the future. When they ask what they should study in their tertiary education I tell them to follow their heart and study what interests them, not what they think will generate a job. It is more important to be a committed life-long, learner-driven learner than to know particular facts relating to one kind of work or another.

It is also pointless to prepare oneself for one of the current crop of job categories unless one expects to be fulfilled by doing this. To study for a job because the job seems to provide economic security or status, but without passion for the work entailed by that job will create considerable misery and will also undermine the habits needed for life-long learner-driven learning which is so critical for thriving in the long term. In the 1990s the work place is changing more rapidly than ever before. The pace of technological and social change means that work skills are made redundant at increasingly fast rates. From my observations and discussions with colleagues it seems that up to 50_per cent of the skills required in the newer, knowledge-based industries become redundant every three to five years. If one looks at the rates of globalisation and technological change and the development of tribalisation, which will lead to an increase in cultural customisation of products and services, it seems reasonable to deduce that in the next twenty-five years up to 70_per cent of all job categories are likely to change. Of this percentage, half of the existing job categories will disappear; the other half will consist of new jobs that do not yet exist. Other jobs will keep their present names but the nature of the work will change.

Technological change is one of the major reasons why workplace learning must be broadened from its traditional narrow base to the world of multi-skilling. To maintain a robot, for example, it is necessary to know about mechanics, pneumatics, hydraulics, electronics and software engineering. All of these were individual disciplines and were the responsibility of individual workers, sometimes belonging to different trade unions. New technology is causing the traditional demarcations between skill areas to disappear, and the need to avoid technology-created demarcation disputes is one of the major reasons for the development of ‘super’ trade unions in the 1990s. The domains of electronic technologies and biotechnologies are also coalescing, as are the domains of the natural sciences, technologies and social sciences. Where these various domains overlap hybridisation is occurring between them, and these areas of hybridisation are now producing the greatest rates of innovation. Multi-media and learning technologies generally are a good example of this. In a world where cultural differences are often being celebrated, it is also likely that technologies will undergo greater degrees of cultural customisation: increasingly the domains of culture and technology are also overlapping.

To respond to these new issues there is now a major emphasis on the development of organisations and enterprises which encourage learning. To be a faster and more effective learning organisation is one of the most significant comparative

advantages any enterprise can have in the late 1990s. We are now entering what Australian organisational behaviourist, Professor Bill Ford, calls 'the era of the "Learning Enterprise"' which creates a dynamic comparative advantage by adaptation to complex and changing environments, achieving continual improvements and reliability and absorption of new concepts and systems innovations.

Ford, in a personal communication to me in 1996, describes the transition which all enterprises (commercial and non-commercial) must make in the following way:

From	**To**
Training and development	Integrated enterprise learning
Training the trainer	Learning skills
Training for the job	Professionalising all employees
Paper qualification	Performance qualification
Hierarchy of authority	Authority of knowledge
Hierarchical development	Shared development
Wages and staff	Single status learning

Most of the significant innovations for the markets of the future will be created by the synthesis of knowledge drawn from market research and from the three great sources of human endeavour: the arts and humanities, the natural and social sciences and the technologies. A modern, professional worker, such as an industrial designer, engineer, planner or architect, will be required to synthesise knowledge from all these areas in order to create new products and services. New innovations result from a combination of market knowledge and advances in the arts, sciences and technology. Multimedia is, for example, a combination of art, science and technology, and it is impossible to tell where art ends and technology or science begins.

In summary, technological change is dating knowledge more rapidly, many new job categories are appearing and disappearing, and technology is changing the kind of work we do. According to the old adage: 'a rolling stone gathers no moss'. Now perhaps the saying should be: 'a rolling stone gets ahead', for a person who is not a rolling stone and who does not change work within and between enterprises will be jeopardising **his/her** future career. A Japanese work place is constantly rotating all its workforce around the enterprise to ensure that organisational and individual learning is maximised and an interdependent work culture is promoted. Success in the future will depend on remaining adaptable, having many job changes and even career changes in our working lives, being as broadly educated as possible and committing ourselves to continuous life-long learning. There should be a culture and education system which nurtures and supports this.

Work-place learning will also be increasingly linked to career-path planning together with credentialling of work-place learning. Until now it has been appropriate to ask people about their current work. In the next decade it will be as relevant to ask people about what they are learning to become as to ask what job they do at present: 'becoming' will become as important as 'being'. With this comes the introduction of increased work-place based learning and career-path planning. Ford pointed out in his letter that the next important component of all work-place learning would be the professionalisation of all employees. If a work place wants to thrive in

the twenty-first century up to 20_per cent of all its resources should be devoted to learning, both individual and collective. The most successful businesses will be those that maximise organisational and individual learning, and good employees will be attracted to work places which offer this. Any work-place learning will need to incorporate the elements of the learning culture, including learner-driven, just-in-time and customised learning. Modern technology can deliver this to people in the work place.

Integrated enterprise learning assisted by personal development planning, with their links to adaptability, innovation and productivity, will become major components of successful work places in the early twenty-first century. These should be complemented by learner-driven, just-in-time learning aided by modern technology.

Promoting the Learning Culture : the teachers role.

The creation of the learning culture means that the teacher will need to play a different role .The role of the teacher can be summarised as being that of: learning catalyst/motivator, knowledge navigator and mentor. In the past access to information/ knowledge was limited and teacher dependent. This is no longer the case and information is ubiquitous, though knowledge and wisdom is still rare . Learning could be described as the process which transforms data and information into knowledge and wisdom . The teacher must be the person who assists the student to achieve this transformation, who catalyses an interest in and love of learning, reminding the student why continuing learning is vital for future prosperity and wellbeing . The teacher must also navigate the student through the world of information/ knowledge assisting the student to discriminate the relevant from the irrelevant, and to embrace relevant information and knowledge so that learning can become a transformative experience The teacher must also become the mentor, providing wisdom to make newly acquired knowledge more useful and appreciated by the student . When you ask a question of knowledge, you get an answer. When you ask a question of wisdom you get another question. Over time the teacher should be responding to the students requirements with fewer and fewer answers and more and more questions, which guide learning into appropriate pathways.

Learning to become a Cosmonaut

Every year there are more cosmonauts and fewer cowboys. However, it is only sensible to consciously develop some programs to help promote the more widespread adoption of Planetist values. The emergence of Planetism is beginning to define the values of the civil society of the twenty-first century. We can recognise the lack of civility in the cowboy-dominated domains, such as the violent precincts of some US cities, Taliban-dominated Afghanistan, Bosnia or Burma, or in the behaviour of terrorists such as ETA or the hard-line Unionists and Republicans in Northern Ireland and cowboy tribal gangs such as the Mafia or the Triads. What is needed is a vision of what civil society in the globalised, tribalised twenty-first century should be, and a number of strategies needed to create a civil society in a Planetist era. The vision will emphasise the rights and responsibilities of the individual in a global society which will be more communitarian and interdependent than that which we have today and with many other aspects associated with Planetist values. As a contribution to the development of strategies to realise a civil

society in a Planetist era, I want to discuss four concepts. These are: promoting a caring culture, developing ‘circles of concern’, reinventing initiation and developing ‘pattern languages’.
In 1989 I took part in a workshop held by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) which met in Beijing to advise UNESCO on the goals for education for the twenty-first century. The workshop decided that the major goal for education should be the Preferred Future of the development of a global caring society. The workshop decided to describe caring as consisting of the following elements:

- caring for oneself, including one’s physical and mental health;
- caring for one’s children, partners, friends and relations, and colleagues;
- caring for one’s community;
- caring for others, including those with different cultures;
- caring for other species;
- caring for the Planet.

This concept of caring therefore incorporates self-esteem, individual health, respect and concern for others, both within one’s family and extending to other cultures and races (that is, intercultural tolerance), and caring for other species and for the planetary environment, leading to the development of sustainable lifestyles and behaviour. A curriculum designed to promote caring has still to be developed though it would be widely used.

When education systems develop curricula they are almost always problem-centred ones directed against cowboy traits such as cultural and religious intolerance, patriarchy and environmental vandalism. They concentrate on discouraging the various ‘-isms’ such as racism and sexism, on the removal of cowboy values rather than the promotion of the equivalent cosmonaut value, on ameliorating the bad through a problem-centred strategy rather than encouraging the good through a mission-directed strategy. Global organisations, such as Greenpeace and Amnesty International, fighting against excessive cowboyism, tend to define their tasks in a similar way.

A mission-directed strategy to achieve the same ends would develop a program of action that involved visualising and creating a mission to realise a caring and compassionate culture, rather than only dealing with the most obvious symptoms. This is a mindset problem, for there is no attempt to envision a caring and compassionate society which could then inform mission-directed strategies that encourage the design and innovation of caring ways and caring ware to promote caring and compassion in a socially and culturally sustainable society.

The second strategy relates to ‘circles of concern’. The Australian philosopher and ethicist Professor Peter Singer introduced the concept of the ‘circle of altruism’ in his book The Expanding Circle. In other publications he calls the same concept the ‘circle of concern’, a term I prefer to use. Singer states:

> *The circle of altruism has broadened from the family and tribe to the nation and race, and we are beginning to recognise that our obligations extend to all human beings. The process should not stop there ._._. it is as arbitrary to restrict the principle of equal consideration of our own*

> *interests to our own species as it would be to restrict it to our own race. The only justifiable stopping place for the expansion of altruism is the point at which all whose welfare can be affected by our actions are included within the circle of altruism. This means that all beings with a capacity to feel pleasure or pain should be included. We can improve their welfare by increasing their pleasures and diminishing their pains. (p._120)*

We all like to be nurtured and cared for and most of us like to nurture and care for others; even the least caring of us cares for a few in their immediate circle. The terrorist who adores his or her family yet is at war with a selected section of humanity demonstrates this. We are all capable of caring, but some are more selective in that caring than are others. Adherents of the cowboy culture are much more selective in their caring and have much smaller circles of concern than do cosmonauts.

A mission for educators and for the media generally is to make people aware of the breadth or narrowness of their own personal circles of concern and to be able to visualise and map them. Then the challenge is to encourage people to expand their circles until they embrace the whole Planet.

The third strategy concerns indigenisation and reinventing initiation. Most females are committed cosmonauts but many males remain cowboys. The emergence of Planetism is therefore favouring most women and threatening many men. In the 1990s people concerned with social welfare and education are noticing that in developed countries the anti-social behaviour and learning problems among boys and men are increasing. In the previous decades affirmative action programs were implemented in the education of girls. Clearly these were critically needed at the time, and the programs were driven by the feminist revolution. We have all benefited from these changes and considerable success was achieved by these affirmative action programs. Now it is time for similar attention to be directed towards the education of boys and men. Boys have not been disadvantaged by the advances achieved by women—the disadvantage has come from larger changes which are favouring women. Many men are now struggling to feel comfortable and accepted in the spaceship, and many react by threatening and making life difficult for cosmonauts and sometimes threatening to vandalise the spaceship itself.
Young men raised in poor and threatening conditions often choose cowboys as their role models. There are not enough cosmonaut male role models for young men in these situations. In their schools they are meeting fewer male teachers. A dominant male role model in popular western culture in recent times has been the lone, isolated, individualistic and often angry cowboy. He is a soldier who unquestioningly and uncritically takes orders to protect the home, rather than a warrior who is guided by inner wisdom. A warrior is a cosmonaut who would prefer peace but who realises that, from time to time, cowboy behaviour must be confronted with cowboy behaviour. A large number of the space-related science-fiction stories, including many on film, are stories set in the cowboy culture while operating in a spaceship environment, with battles between good and evil and intertribal/ intergalactic conflict. The shoot-out at the OK Corral is now done with laser weapons fired from spaceships. Such narratives might be technologically advanced but they are sociologically archaic. A cosmonaut story set in a spaceship would attract an even

larger viewing audience because it would involve a genuine exploration of future social environments.

If we are to find both the appropriate archetypes and the means to transform cowboys to cosmonauts we must visit the world of myth. In his book Myths to Live By Joseph Campbell notes:

> *In the human species, with its great brain requiring many years to mature, the young are born too soon, ._._. [and the home is] ._._. a sort of external womb.*
>
> *Now it is during this life stage of the home that all the basic social imprintings are established. They are associated, however, with an attitude of dependency that has to be left behind before psychological maturity can be attained. The young human being responds to the challenges of his environment by turning to its parents for advice, support and protection, and before it can be trusted as an adult, this patterning must be altered. Accordingly one of the first functions of puberty rites of primitive societies, indeed of education everywhere, has always been that of switching the response systems of adolescents from dependency to responsibility—which is no easy transformation to achieve. And with the extension of the period of dependency in our own civilisation into the middle and even late twenties, the challenge is today more threatening than ever, and our failures are increasingly apparent. (p._46)*

The majority of people with higher educational attainments are cosmonauts. Indeed it is inconceivable that without universal education John Donne's values would be so widely shared today. In general, the supporters of Le Pen and Hanson are people with less education.

Campbell further states: *'The first function of the rites of puberty ._._. must be to establish in the individual a system of sentiments that will be appropriate to the society in which he is to live, and on which that society itself must depend for its existence'.*

In his controversial book Iron John the American poet, Robert Bly, proposed that society needed to reinvent initiation, arguing that the initiation process in traditional and indigenous societies has been discarded by modern communities and cultures at enormous social cost. Bly's thesis is that in contemporary western society boys are running around in men's bodies, still doing what boys do but with men's strength and with the adult technology. Bly points out that for women, puberty manifests itself with biological change. Unless men can experience a cultural change that is as powerful for them as the biological change is for women, boys will never progress to fulfilled manhood.

Bly quotes from Michael Ventura's essay The Age of Endarkment:

> *Tribal people everywhere greet the onset of puberty, especially in males, with elaborate and excruciating initiations, a practice which would not be as necessary unless their young were as extreme as ours.*
>
> *They would assault their adolescents with, quite literally, holy terror, rituals that had been kept secret from the young until that moment,*

> *rituals that focussed upon the young all the light and darkness of their tribe's collective psyche, all its sense of mystery, all its questions and all the stories told both to harbor and answer these questions ._._. The crucial word is focus. The adults had something to teach: stories, skills, magic, dances, visions, rituals. In fact, if all these things were not learned well and completely, the tribe could not survive ._._. This practice was so effective that usually by the age of 15 a tribal youth was able to take his or her place as a fully responsible adult.* (pp._180–1)

Bly suggested that we bring back initiation as a mainstream concept. Through the reinvention of puberty rites or initiation in an appropriate form we could create cosmonaut tribalism, interdependent individuals, organisations and communities and ensure the maintenance of social and cultural cohesion in a globalised and tribalised Planet. Initiation must become a part of mainstream education in the years of puberty, even to the point of becoming the full-time focus of education during these critical and vulnerable years.

Most indigenous cultures choose the years of puberty to provide what their version of a formal education process. A number of teachers and educators claim that during the years of puberty many young people can be impossible to teach and are unwilling to learn; they only seem to be interested in gaining access to what have been (until this time) the secrets and the forbidden fruits of adulthood. They stand on the exciting threshold of adulthood, they are at one of life's transforming and defining moments. Indigenous cultures took this moment so seriously that they prepared children for, and celebrated, this transformation through a program of education and ritual.

Bly states that modern society has disposed of initiation at a huge social cost. Initiation was an important means which indigenous societies used to transform irresponsible children into responsible adults. They created warriors to service the needs of the community and deal with those who threatened hearth and home. Uninitiated men remained as children who were harmless in children's bodies, but in an adult body could do immense harm to a tribal community.

On the threshold of adulthood young people are really only interested in one thing—in becoming effective adults. It is hardly surprising that they are less interested in history and mathematics.They should be given the opportunity of doing this full time in the years of puberty. Given the huge social costs of abandoning initiation it is amazing that something so successful should have been discarded. This is certainly a consequence of the era of Modernism which regarded all such activities as irrelevant, and as the concerns of" inferior" cultures. In the PostModern present and to prepare for the Planetist future it is essential that initiation reoccupy its rightful place in education and social and personal; development. Although we have thrown initiation out of mainstream learning the need is still there—so much so that many street gangs often incorporate ritual and rites of passage into their gang cultures. In the absence of formal initiation processes based on local tribal cultures a de facto process has evolved in most developed and developing countries. The vacuum has been filled by American teenage culture and all that entails, and this has become a global archetype. Young people have chosen their own initiation, and American teenage-hood has been exported to the entire Planet. Today the cultural

imperialism imposed by the mass media is made possible by the lack of cultural resilience caused by the absence of initiation.

The reinvention of initiation is needed to aid the transformation from child to adult, and more particularly, to facilitate the development of cowboy children into adult cosmonauts. True cowboy behaviour in its destructive form usually begins at puberty when young men should be undergoing initiation. Initiation should be the major focus of education during the years of puberty, and this transformation should be widely celebrated as in former years. Initiation involves some gender specific learning. It takes dependent people and moulds them through a formal educational process into independent people who are also able to recognise the central importance of interdependence for tribal or community wellbeing. Initiated people understand that community responsibility requires the sacrificing of independence for interdependence when necessary.

Traditional cultures have used the initiation process to reaffirm their culture to their young by having them learn their cultural myths, and to prepare them to be effective and responsible adults and parents. Australia's Aboriginal people are more fortunate than European Australians in this regard for there are many who know about, and still practise, initiation. In the Aboriginal culture the traditional initiation process accomplishes two things. First, it affirms and promotes the Aboriginal culture and Aboriginality; secondly, it provides the Aboriginal people with the skills and capabilities to thrive in their adult world. The first aim is still relevant but the second was only appropriate for Australia before European settlement. That aim needs to be reinvented by the Aboriginal people to provide the mindsets and tools to assist young Aboriginal people to become successful Aboriginal adults who can both celebrate their culture and also thrive in the multicultural Australia of the late twentieth and early twenty-first century. Aboriginal people recognise the central importance of initiation, yet to my knowledge there is no program or vision for the reinvention of initiation in the way I have described. This situation probably applies to most indigenous people who have been damaged by the processes of colonisation. As part of the process of reconciliation between indigenous and immigrant Australians, and between immigrant and indigenous cultures all over the world, it is important to create new initiation processes containing culturally specific (that is, tribal components) and national and global components. In countries with a history of immigrant indigenous confrontation, such as Australasia, the Americas and Africa, initiation can be used to give young immigrant cultures the opportunity to learn more and deeply about the respective indigenous cultures in order to help to reconcile indigenous and immigrant cultures, which is a necessary prerequisite for cohabitation on the spaceship. We can call processes which educate immigrant peoples about indigenous cultures 'indigenisation'. All peoples and communities who have had their perspectives and values moulded and narrowed by the Modernist era would benefit from a such program of indigenisation. I would regard it as an essential element of any coherent program designed to assist young people to prepare for success in the Planetist future. Indigenisation should be a component of all initiation processes where immigrant–indigenous relationships are damaged and must be healed to enable the development of a future relationship based on interdependence. In the PostModern present many immigrant cultures have been attempting to make agreements with the indigenous cultures which they have dispossessed in the past. One example of this is the historic agreement in Guatemala in early 1997 which ended thirty years of civil war. In Australia the Mabo

and Wik decisions by the High Court of Australia and the Native Title Act, which was the Federal Government's response to the Mabo decision, have ensured that indigenous Australians have some land rights. Other examples are the stand for human rights by indigenous groups in the southern Mexican state of Chiapas against the immigrant-dominated national government of Mexico, and the Maori–Pakeha (indigenous–immigrant) conflicts in New Zealand. Many other examples could be cited. Behind all of them is a changing mindset of the immigrant peoples about the status of indigenous peoples. There are emerging cosmonaut majorities who favour reconciliation processes and this is aided by emerging Planetist global opinion. But there are still cowboy minorities who want to continue the dispossession, often led by immigrant landholders in rural areas who have trouble coping with the lack of 'certainty' in the new order.

In the Post-Modernist era the emerging cosmonaut majority in many of the countries with a history of immigrant–indigenous conflict is insisting that the damage of the colonial past be repaired before an era of reconciliation and interdependence becomes viable. For as long as the indigenous people are still dependent on welfare from the immigrants they cannot move on to independence. Without indigenous independence, fair negotiation between immigrants and indigenous peoples to create new arrangements for a future relationship based on interdependence and conciliation is not possible.

In countries such as Australia and in many parts of south and Central America and Asia and Africa there is conflict between immigrant and indigenous peoples; the arrival of Planetism will require all immigrant people to indigenise themselves to a greater extent than they have been willing to do. Conciliation between these people will follow indigenisation.
The content of an initiation program could be very different from traditional rituals. An initiation which reaffirms one's tribal culture yet prepares one for thriving in a global culture would have certain aspects in common with traditional initiation. Initiation could introduce the young to the world of heroes and myths, spirituality and comparative religion, ethics and values, intercultural and traditional knowledge and teach the young how to build effective relationships. Such an initiation process would prepare young people for responsible and purposeful living in the spaceship culture. Any initiation program should also emphasise the enterprise learning passport, so that young people acquire the capabilities to chart their own lives, fulfil their own destinies and develop and maintain good relationships.

Initiation unites youth and aged people in a way which gives focus and purpose to both groups, improving the wellbeing of both. Initiation essentially seeks to shorten the unstable and vulnerable period of youth. Traditionally it involves the formal transfer of responsibility for developing the next generation from the parents to the community and in particular, to the older people of that community (the elders). Initiation also plays a major role in the life of older people. In societies where it has been discarded and where older people are separated from the community (in retirement villages and the like) it is likely that the wellbeing of older people has declined. The loss of social processes such as initiation and the nuclearisation of family structures has contributed to the lack of intergenerational equity by empowering the middle years and disadvantaging both the young and the old. In particular, older people are increasingly locked out and are given fewer opportunities to contribute to the wellbeing of the community. In developed

countries the Third Age is a period where older people devote the major part of their lives to their own enjoyment. It is a community-approved period of self-indulgence, but it does not provide sufficient opportunities for many older people who would like to give back wisdom and knowledge to the community. Many older people have great difficulty adjusting from a life of full-time work to one of full-time enjoyment. Many older people are seeking to remain in the workforce on a part-time basis for they find that this enriches their lives. The reintroduction of initiation would allow some older people an organised opportunity to play a new and meaningful role in their community.

Elders are traditional keepers of wisdom. In the initiation process elders work directly with their grandchildren's generation, often bypassing their own children's generation. Parents are relieved of some of the responsibility of guiding their own children's transformation into adults. In some ways, parents can be too close to their own children; this may make them less willing to submit their young to undergo often traumatic rituals even though it would be in the community's interests, and through that their own children's long-term interests. Are parents genetically programmed to be good developers of their offspring in the years after puberty? Perhaps traditional cultures recognised how hard it is for parents to reinvent themselves when their children reach puberty so they can develop a new relationship with their own offspring based on independence, whereas hitherto this relationship has been based on dependence.

As well, many older people feel marginalised. It is absurd that so much talent, knowledge and wisdom suddenly becomes unavailable to society through a process we call 'retirement'. Retirement itself is changing, and many baby boomers have made it clear that they plan never to retire and be marginalised by their children in the way they themselves have marginalised their own parents. They are finding ways of continuing to work on a part-time basis. Baby boomers are showing signs of reinventing the concept of ageing. Some aged people may reinvent ageing as elderhood, to assist in preparing the young for adulthood.

Not all old people should, or would, want to be elders. Those who wish to become elders should earn the right through a process which gives them the opportunity to demonstrate that they have the appropriate experience and wisdom. They should also be given the opportunity to learn the necessary skills to be elders and to graduate as elders through an appropriate ritual. Elderhood would be a second initiation later in life. Many older people might welcome the opportunity to play such a role and might seek to become elders. A formal program of learning and preparation could be prepared for elderhood, with appropriate tertiary education certification, so that elders could be given a new and core role in the national system of life-long learning.

The fourth of these strategies is the creation of 'pattern languages'. A pattern is a physical way of encoding the knowledge of a person, group or community for the making of an artefact, product or service to enable it to be replicated. The most obvious use relates to clothing. However, there are countless examples in the world of art, industry and technology. Patterns allow for flexibility of approach, and one is not required to copy every aspect—only the components one wishes to replicate. One can modify the pattern and the ultimate product or service. A pattern for food-making is a recipe.

The architect, Christopher Alexander, and his colleagues in Berkeley, California pioneered a concept called ‘pattern language’. In their work, Alexander and his colleagues have assembled a series of descriptions which describe how people live and how they associate with their built environment. Each description is encoded as a pattern. Each pattern relates to a particular social or cultural function such as eating, sleeping, recreation or relaxing. A ‘pattern language’ is a collection of patterns which can be transmitted as a collective archive encoding cultural and social patterns of living. The pattern language can then be used to create physical environments which express the values and living patterns of that culture. Alexander’s methodology is now used by architects around the world because, though it was originally conceived for a relatively narrow set of goals related to the encoding and transfer of cultural patterns for built environments, the methodology of pattern language can have broader social applications. Alexander initially concentrated on the social and cultural agenda but his methodology can also be used by engineers, architects, industrial designers and urban, transport and social planners to promote economic and ecological sustainability.

Cultural sustainability can be largely achieved through the customisation of physical and social infrastructure and the development of cultural precincts, and for the cultural customisation of communities. Patterns of living and the physical arrangement of spaces can be recorded and used for the cultural customisation of living and working spaces. These patterns can encode how people of different cultures use space to sleep, eat, work and use and seek privacy. Alexander has taught the Japanese how to build modern structures which reflect ‘Japaneseness’. The Japanese had always included traditional patterns in their built environment, which can be seen today in cultural icons such as Kyoto. The built environment of modern Japan, however, does little to reflect Japanese culture. The development of patterns of ‘Japaneseness’ allows modern communities to be built that still reflect Japanese culture. The development of ‘pattern languages’ can also become a vehicle for the promotion of cosmonaut tribalism, for it will permit the creation of cultural precincts in multicultural cities, and permit the celebration of cultural diversity in our communities.

As Chief Executive Officer of Papua New Guinea’s Environment and Conservation Department in the late 1970s, I established a program to encode the pattern language of Melanesian cultures. This program was initiated by two architects, David Week and Ken Costigan, who were students of Alexander. Many Papua New Guineans are faced with making a choice between living in their traditional village, which lacks many of the comforts of modern life, and moving to a modern western-style town, which reflects nothing of Papua New Guinean culture. It is a classic Modernist dilemma. The Papua New Guineans were asked: ‘What are the qualities and facilities which you have in your village which should be built into a modern urban environment, so that when contemporary communities and developments are built it is possible to incorporate the best of both the traditional cultures and facilities of contemporary buildings?’ In this way traditional lifestyles, practices and behaviours were recorded and converted into patterns, and they could then be built into a Post-Modern village or town environment.

Aboriginal communities could use a similar encoding process. Most contemporary housing provided for Aboriginal people is based on the patterns of immigrant not

indigenous cultures. As part of the reconciliation process patterns of Aboriginality could be encoded and built into all Aboriginal communities.

7. Preparing for Thrivability in a Planetist Future: Innovation

Innovation can be of two kinds. One of these is a problem-centred element which involves improving the efficiency, quality, productivity and design of existing produces, services and technologies. This is 'improving the old' innovation. The other is a mission-directed element which involves doing new things first and best. This is 'creating the new' innovation. In cultures dominated by problem-centred strategies the first type of innovation totally dominates and it is relatively easy for businesses, for example, to borrow money to improve the production of current products and services, but it is exceedingly difficult to borrow money to create new ones. 'Improving the old' innovation, which usually involves introducing new technologies into the work place, tends to throw people out of work. 'Creating the new' innovation will create new jobs. A problem-centred culture will tend to create jobless growth while a mission-directed culture will be much more likely to create job-rich growth. A structural adjustment program which places too much emphasis on upgrading the existing industrial base accompanied by a related downsizing of labour, without emphasising the envisioning and establishment of new twenty-first century industries which would employ most of the high quality graduates from the educational system, will produce the high unemployment levels that are characteristic of many developed countries of the late 1990s.

Innovation has two critical elements: creativity and enterprise. Innovation is not the same as invention. Invention involves creating a good idea, concept, prototype product or service. Innovation, on the other hand, involves turning inventions into marketable products and services. Countries such as Australia are highly inventive. Australia, for example, is a world leader per capita in the publication of scientific papers and has a very high per capita representation in international ranks for the number of patents that are registered. However, Australia is a global laggard at turning inventions into innovations.

An innovation culture develops a nation of job-makers rather than job-takers. For more than a hundred years a central goal of the education system has been the creation of a nation job-takers who for most of this century were meant to be docile and uncritical takers of orders. The word 'training' is an anachronistic remnant of this culture: a trained person was, for the most part, taught to do rather than think. Education has produced many people who were 'trained' for jobs in a system which placed much emphasis on vocational 'training' and not enough emphasis on generic skills for personal and professional development. Much of the education system still does this. In a world that needs more innovations and innovative enterprises to shape the next century and prepare for success in a Planetist world, what is needed is a major emphasis on job-making. This is not just a task for governments and business leaders, this is something that should involve everybody. It is people—all people—who recreate themselves as job-makers. It is the role of governments and business leaders, and every other leader, to ensure that the art and science of job-making becomes a central core of cultural development.

Invention is having a good idea. Innovation is turning that good idea into a tradeable product or service. Innovation involves the capacity to do and create new things. Part of this innovation involves doing old things in new ways: in other words creating continual improvement. This is what innovation is to most people. However there is another side to innovation, this involves doing new things first and best. This involves for example, understanding the nature of the emerging Planetist culture and developing the products and services needed to help the transformation from the Cowboy to the Spaceship culture. In the last part of my talk I am going to be listing some of the 21st century industries, which are now emerging to help in this transformation.

An innovation culture develops a nation of job makers rather than job takers. An innovative person is a *job maker*, not only a *job taker.*

Australian folklore is rich with stories of bright Australian ideas being lost to Australia because of insufficient entrepreneurial and financial support, and these ideas being used to generate wealth for people in other countries. Economic success now depends on knowledge and it is even more dependent upon brainpower than previously. Ultimate economic success in a planetary society will go to those countries, institutions, companies and individuals who best use their inventiveness, intelligence and cleverness. In the 1980s we talked about establishing a clever country. However we failed to develop a coherent structure to realise this vision. The fact that Australia in the 1990s is still not a clever country is not due to economic causes. The emphasis in the 1980s and 1990s on micro economic reform, important though it is, fails to fully recognise the critical importance of cultural factors. Economists continue to believe that our economic problems have economic causes and prescribe economic solutions.

Education in the 1990s still produced many people who are being prepared for jobs which are not there. This is because our structural adjustment overly emphasises increasing the productivity of the existing industrial base with a related downsizing of labour, without emphasising the envisioning and establishment of new 21st Century, industries which would employ most of the high quality graduates of our educational system. Therefore we need to look ahead to anticipate what longer term future markets want and then create the innovations and enterprises to best service those future markets.

Innovation has two elements, being creative and being enterprising. An innovative person is one who is both creative and enterprising. The great bases of creativity are the disciplinary groups of the arts and humanities, the natural and social sciences and the technologies. In the 1990s most Australians are still not knowledgable of the major principles and concepts in all three areas. There is a convergence within each of these three disciplinary groups and between them, however this is not reflected in the education system, which still separates the three great disciplinary areas of creativity. In the late 1990s there is a recognition that new interdisciplinary approaches are needed to deal with products of this convergence, such as mechatronics, optoelectronics and multimedia. We must now promote an education system which engenders respect for all these three great areas of creativity and in depth knowledge in at least one of them. We must also promote the capacity to integrate knowledge from all these bases into new integrated forms of knowledge.

A considerable part of modern scientific and technological innovation relates to the development of new products, services and technologies based on the four great technological revolutions of our time:

- Cyber technology including IT based on the silicon chip or microprocessor, and what I believe will be its successors, Knowledge Technology (KT) and Wisdom Technology (WT)
  - Data plus purpose equals information
  - Information plus culture equals knowledge
  - Knowledge plus experience equals wisdom

- Biotechnology based on the manipulation of the DNA molecule. this will eventually lead to the development of IT, WT, and KT based on the element carbon instead of silicon. The awesome power of biotechnology is now only beginning to be realised. with wide applications in medicine, agriculture and veterinary medicine,in mining and in environmental protection, bio technology is at least as important as IT in terms of innovations for the future.

- Advanced Material technologies based on the development of a number of new materials with exciting new characteristics in areas such as electrical conductivity (superconductivity) and magnetism.

- Nano and Micro Technology which involves the development of miniaturised systems, including new, minute machines and systems which are no bigger than the molecules upon which they operate. Many of the biggest contribution will be in biotechnology which is in fact an organic nano technology.

Many innovations in the 21st century will be based on the use of these four generic or enabling technologies. These will include innovations in traditional fields such as agriculture, medicine, manufacturing, transport, tourism, energy, environment and education. In the environment field, for example, information technology can help to assess the use and conservation of land, forests and fisheries through remote sensing from satellites. Biotechnology can help to develop more effective bacteria to consume oil spills, create proteins which can alter the function of T cells to stop the onset of AIDS or prevent the development of auto immune diseases such as MS, Lupus, Rheumatoid Arthritis and child onset Diabetes, or to protect plants and make them immune to destructive insects, thereby obviating the need for insecticides. New materials and technologies can produce powerful new magnets to be used in highly energy-efficient levitating trains. While I have emphasised technology here, innovation involves growing our capabilities not only in technologies, but also in the arts and humanities and the social and natural sciences as well. All people while they might be particularly good in of these areas should have enough knowledge of and respect for the other areas so that they can work successfully in collaboration with people with greater expertise in these areas.

Successful innovation will often involve creating the Ways and Ware previously for emerging Planetist markets.

In a 1988 paper, written for OECD Centre for Educational Research and Innovation (CERI), Colin Ball introduced the concept that, if people were to thrive in the 21st

century they would need to simultaneously develop capabilities in three different educational arenas. He named each of these *Educational Passports*., based on the idea that a *passport,* helps to define a person's right of passage. He suggested that these three *Passports* are:

- an *academic passport* which is the traditional role of education, The visas in this passport consist of the capabilities of literacy and numeracy, and cultural linguistic, scientific, artistic, technological and social knowledge which enables a person to play a meaningful and self fulfilling role in society and culture .

- a *vocational passport* which focuses on the specific education necessary for the effective performance of work, such as technological, financial, management, and marketing knowledge, in a world of rapid technological and social change.

- *an enterprise passport* which contains the curriculum to promote the development of enterprising people. Colin Ball and his colleagues developed the following description of an enterprising person:

An enterprising individual has a positive, flexible and adaptable disposition towards change, seeing it as normal, and as an opportunity rather than a problem. To see change in this way, an enterprising individual has a security born of self-confidence, and is at ease when dealing with insecurity, risks, difficulty and the unknown. An enterprising individual has the capacity to initiate creative ideas ... develop them, and see them through into action in a determined manner. An enterprising individual is able, even anxious, to take responsibility and is an effective communicator, negotiator, influencer, planner, and organiser. An enterprising individual is active, confident, and purposeful, not passive, uncertain and dependent ... (Ball,Plant and Knight,1989).

In previous decades many of our people were unenterprising by this definition, and so we sought to create a nation of enterprising people. The Finn, Mayer and Carmichael Reports, which introduced the concept of competencies, were presented to the Commonwealth Government in 1991 and 1992. These reports did however commence the journey towards the development of a innovation culture. They made a mistake however of placing competencies under the existing vocational passport rather than in a new and separate enterprise passport of equal value to the other two passports .

Many people tried to list the capabilities or competencies which are needed for the development of an enterprising individual. One list, which is based on an initial list developed by David Turner includes:

- Assessing strengths and weaknesses
- Making decisions
- Working cooperatively in teams and groups
- Planning time and energy
- Carrying out agreed responsibilities
- Negotiating
- Dealing with power and authority
- Solving problems

- Resolving conflict
- Coping with stress and tension
- Evaluating performance
- Communicating both verbally and non-verbally
- Developing strategic visions for self and organisations
- Thinking and intervening strategically and systematically to shape the future

The Education System as a place of Innovation

Every school/learning centre should become a place of innovation. There are many innovations we need to create if the outcomes I have been describing are to be realised. This in turn creates economic opportunities for educators Earlier I talked about the development of Ways and Ware. What learning ways and ware can be developed to help to customise learning for different thinking and learning preferences, so that all may maximise their learning? What new learning ways and ware can be developed to customise learning for different multiple intelligences, both to assess these intelligences and to optimise learning in each of them? What learning ways and ware can we develop to create virtual reality experiences to put learning in an the context which will best assist learning . What learning ways and learning ways are possible to enhance learner driven learning and just in time learning? The list is only limited by imagination and entrepreneurship . I am of the view that just as today the world is being dominated by economic growth caused by the development of the internet , in the next ten years it will be dominated by the innovations in the field of learning, to promote the growth of human potential, and the environment. This will be achieved through the development of learning ways and learning ware, and of green ways and green ware to create a sustainable future . For me these are the two next big things. I would like to see the education system promote new product and services development at both the levels of the whole system and the individual school . Many of you will have thought of new and better ways to achieve better results in your schools. How about taking this to n the next step and become an innovator? What we need is a system which promotes this innovation to make education more productive and effective . At the same time this will generate income for both the education system and individuals within it. Perhaps some of you teachers will become the new entrepreneurs of the new learning ways and learning ware , and also of the new innovation ways and innovation ware to promote the development of an innovation culture. In the next 20 years Planetist markets will increasingly demand these

8. Preparing for Thrival in a Planetist Future: Creating sustainable prosperity in a sustainable society .

A Sustainable Society is one which has the capacity to exist more or less indefinitely, and at the same time adapt and change because it operates within and is respectful of, natural limits. A more traditional definition of a sustainable society is one which is able to meet the needs of present generations without undermining the capacity of future generations to meet their needs.

The fear that human activity is undermining the capacity of human society to exist indefinitely is a major element of international discourse, and increasingly of international and national politics as well. A critical mission for the next twenty-five years is for the Earth's peoples to design and innovate their way to the creation of a

global, sustainable society. In the next decade the development and marketing of innovations to help realise a sustainable society will become a major economic growth area. This mission would consist of a number of steps. The first step is to imagine the nature of such a society by developing a series of visions of a sustainable society. Most of us appreciate that many of our practices and much of our behaviour might be unsustainable but we do not often visualise what might comprise a sustainable alternative. We do not have a vision of what a sustainable society might look like and how it differs from our current unsustainable society. The second step is to find the means of achieving the knowledge, designs and innovations to realise sustainability, and to apply this in developed countries. A considerable proportion of this knowledge will be developed by a Post-Modernist integration of knowledge drawn from the world's diverse cultures, including indigenous cultures. As we turn our backs on Modernist approaches, there are many ways that people behaved in Pre-Modern times that are now becoming appreciated again in Post-Modern times. For example Planetism involves the replacement of the PostModern concept of "humanity against nature" with the PreModern concept of "humanity as part of nature" In addition, there will be a need for some genuinely new mission-directed strategic thinking to deliver innovations that will create a sustainable future. Many of these will incorporate the four generic technologies. While it is likely that a large proportion of this knowledge will be created in developed countries there is no reason why developing countries cannot also accumulate the knowledge. Irrespective of where they live, those who develop the designs, products and services for a sustainable future will find large global markets for their innovations. The third step is to complete the transformation of the remainder of the Planet to a sustainable society by the transfer of knowledge and technology and the provision of appropriate investment. Of course, the issue of global population increase will not be solved by the application of a vision of a sustainable society. The net reproduction rate (number of children per fertile female) is dropping rapidly throughout the world, however, there is a large demographic bulge of fertile women who are currently having children and this will mean that population growth will not reduce for several decades and a stable global population will probably be reached in the third quarter of the twenty-first century.

When we consider the widespread use of the word 'sustainable' in any discussion about economic development or production, and about development or environmental management, it is surprising how few people have attempted to visualise a sustainable society. Even science-fiction writers—the creative people most likely to provide these visions—have generally failed. Science-fiction classics such as *Brave New World*, *1984* and *Neuromancer* are grim warnings rather than inspiring forecasts. Science-fiction films often do the same thing. If we wish to create a sustainable future we need to ask: 'What are the key elements of a sustainable society? How would these differ from the unsustainable society we live in at present? What do we have to do to transform an unsustainable society to a sustainable one?'

Among the critical contributors to the creation of a sustainable society will be the design-based professions such as architects, engineers, planners and industrial designers. The utterances of government and the social science-led bureaucracies which guide them might lead you to think that the major determinants of a sustainable future will be macro-economic policies, such as incentives and taxes and environmental regulations. The role of legislation is particularly overrated, and

the preference given to the role of the law is a manifestation of the excessive belief in the usefulness of problem-centred strategies. Laws can stop or limit undesirable actions and events but they are less successful in making desirable events and actions happen. Of course, laws are important but it is my view that their relative contribution has been overestimated, while the role of design and innovation, and particularly mission-directed design and innovation, has been largely ignored.

In 1993 I worked as a facilitator at the World Architecture Conference in Chicago. The theme of the conference was ‘Architecture at the Crossroads: Designing a Sustainable Future’. This theme emphasised the idea that the journey toward sustainability is one of innovation and design, a mission-directed approach. The conference adopted a ‘Declaration of Interdependence’. This is a code of ethics and commits architects to promoting sustainable design in their work. The Congress also included a component called ‘Architecture 2020’ which required the architectural delegates to use their imaginations to design sustainable buildings for the year 2020.

The word ‘sustainability’ was widely used in the 1987 Report of the World Commission on Environment and Development, also called the Brundland Commission (named after the then Prime Minister of Norway and now Director General of the World Health Organisation, Ms Gro Harlem Brundland). The Brundland Commission promoted the concept of sustainable development—a concept which emerged in the consultation process leading to the 1980 World Conservation Strategy produced by the International Union for the Conservation of Nature.

A sustainable society is one which is prosperous in four different ways these are

- ecological prosperity;
- economic prosperity ;
- social prosperity;
- cultural prosperity.

I believe we need not a triple bottom line but a quadruple: one which measures levels of poverty/prosperity in all four forms

. A sustainable society will be a Planetist society. Economic growth which is either benign or positive in terms of realising a Planetist future will be sustainable economic growth. Those who promote a zero growth future, or take the view that any form of economic growth and a Planetist future are incompatible, assume that the current forms of economic growth are the only possible forms of economic growth.

A mission-directed policy for sustainable economic growth will promote growth that realises a Planetist future. A sustainable society and a growing economy are compatible, provided economic activity is dedicated to providing the products and services demanded by a cosmonaut future, not a cowboy past. We need more economic growth, not less, for there are billions of people who need more prosperity than they now have. Economic growth which involves the delivery of products and services required to realise a Planetist future, or which are benign in terms of a Planetist future, will be sustainable economic growth.

The voyage to a sustainable society, to a Planetist future, which is already underway and providing economic opportunities for those who are able to see them, will provide many more economic opportunities in the next two decades. This voyage involves overcoming obstacles created by cowboy culture and cowboys, accomplishing initiatives—which involves establishing cosmonaut institutions and organisations, making improvements to existing infrastructure, qualities, facilities and opportunities and nurturing heritages—the knowledge, wisdom and practices from the past that are relevant to or important for the Planetist future. The vehicles which will provide the means of realising a Planetist future will be the innovations, the Planetist ways and Planetist ware, demanded by the Planetist market-place.

In some countries, including Australia, the term ‘sustainable development’ was, during the early 1990s, specifically narrowed to refer to ‘ecologically sustainable development’, thereby narrowing its meaning. This change was promoted by environmental groups who were anxious to emphasise the need to upgrade the importance of ecology relative to that of economy, in government planning where economic considerations are usually allowed to override ecological considerations. While this concern is real and the sentiment understandable, the result has been that the whole issue of sustainability has been marginalised because it is seen to be of concern to environmentalists and natural resource agencies of government, but not to economic or social agencies. This misconstrues the concept of sustainability and the fact that sustainability involves managing four kinds of prosperity simultaneously.

Planetism is the paradigm for a sustainable society, one which is economically, ecologically, socially and culturally prosperous . A society which is economically poor while ecologically prosperous is not a sustainable society for its prosperity is not sustainable. A sustainable society will not only have sustainable development ,but development .production and consumption as well.

Each form of prosperity must be measured in its own terms. An action which promotes one of these at a rate or in a form which significantly undermines the viability of another form of prosperity is not working towards sustainable prosperity. For example, some actions might promote ecological prosperity but does so while increasing economic, social or cultural poverty is not creating sustainable prosperity. An action which achieves ecological prosperity through protecting a forest while totally wrecking the economic and social prosperity of a community that is dependent on that industry is not working towards sustainable development. Likewise, an economic development that seeks to give a regional economic prosperity but which decreases cultural prosperity through the decimation of an indigenous community is not assisting sustainable development. It was recognised that, in the period of time required for the transition to sustainable development, there would need to be trade-offs between ecological, economic, social and cultural goals. To allow for this most policy-makers have also advocated open, consensus-based planning processes to ensure that the necessary compromises required to accommodate these trade-offs did not result in any form of irreversible environmental change, and that any accommodations which were made also had broad community support. We can’t create one form of prosperity while creating another form of poverty if we wish to create a sustainable society with sustainable prosperity.

A major thrust of environmental policy in the 1980s and 1990s has been the development of planning processes which integrate the disciplines of economics and ecology into a complementary decision-making framework, ensuring that equal recognition is given to both disciplines. ‘Economics’ means ‘managing the home’ while the translation of ‘ecology’ is ‘understanding the home’. It could be said that most environmental problems have occurred because economists know very little about ecology and ecologists know little about economics. Much of the so-called ‘environmental crisis’ has been caused by overspecialisation encouraged by the education system.

Since 1967 when Kenneth Boulding discussed the need to transform the ‘cowboy economy’ into the ‘spaceship economy’, some economists have been trying to integrate ecology and economics. This new environmental economics movement could be called Planetist or Cosmonaut economics. Kenneth Boulding would be pleased to find that some thirty years after his challenge that the world needed to create a ‘spaceship economy’ that some serious thought is being given to the creation of ‘spaceship economics’ so that we will have the economic tools to design and build a spaceship economy. It has taken thirty years because most economists and most economic planning agencies of governments are still devotees of cowboy economics. They are creating cowboy globalisation instead of cosmonaut globalisation and are promoting the five forms of unsustainable economic growth. These are the forms of economic growth that are creating so much of the global resistance to, and so many of the victims of, globalisation.

Most economists still have limited understanding of ecology and how economics must be transformed by the recognition of the contribution which ecology has made to human knowledge. This must happen if economics is going to become part of the mission to a Planetist future, rather than an obstacle to be dealt with on the voyage. Planetist economics involves redesigning economics itself to reflect the fact that humanity is part of nature. It challenges the traditional economic view that natural capital, including biodiversity, has no real value until it is transformed into human and industrial capital. It challenges the traditional view that environmental services provided by nature—such as the creation of clean water, the conversion of atmospheric nitrogen into plant protein by Rhizobium bacteria in the roots of legumes, and the work of bees which pollinate the world’s crops—are free. These services ensure the proper functioning of the spaceship and are critical for our continuing ability to live on the planetary spaceship. The saga of Apollo 13 illustrates the consequences of failing to continue to provide this service to humanity. In his speech quoted earlier, U Thant was referring to Cowboy economics. Cowboy economics is anthropocentric. It believes humanity is pitted against nature and that nature’s function is to be in the service of humanity, that it is quite acceptable to liquidate natural capital in order to develop human and industrial capital, and that we should continue to expect the Planet to continue to provide its environmental services free of charge.

Each of the four kinds of sustainability must be measured in its own terms. For example, ecological sustainability should not consider economic or social arguments, it should consider issues such as nutrient and energy flows, the ability to renew energy flows, biodiversity changes and other ecosystem changes such as the growth of deserts or global warming. Economic sustainability should consider economic equity, both intergenerational and intragenerational, and the usual

economic criteria such as return on capital, discount rates, etc. There should be appropriate and similar criteria applied to cultural and social sustainability. Until trade-offs begin to occur between the various forms of sustainability they should be allowed to develop within their own frameworks.

When the World Commission on Environment and Development published its report *Our Common Future* it outlined five principles of sustainability. These principles provide useful assistance to those who have the task of trying to accommodate the competing demands of different forms of sustainability into a single policy or program, or to assess the sustainability of a product or service. No doubt these principles will be superseded by more sophisticated ones in the future. These principles are:

1. Intergenerational equity. This acts to ensure that present generations are able to utilise the natural resources and the environment to fulfil their needs without diminishing the capacity of future generations to utilise these resources to fulfil their needs.
2. Intragenerational equity. This acts to ensure equitable sharing of resources and opportunity among present generations.
3. Precautionary principle. This acts to ensure that if there is doubt about the environmental impact of a development process caution should prevail. If there is a significant environmental risk the action should not be taken.
4. Conservation of biodiversity. This acts to ensure that other species are also able to live indefinitely on this Planet and are not endangered by development and production, and where possible the species' stock is replenished if populations are low.
5. Internalisation of environmental costs. This acts to ensure that the true costs and life-cycle costs of protecting and restoring environmental damage are reflected in the price of a product or service.

Designing an Ecologically Sustainable Society

In 1994 I spoke at a conference in Malaysia on the design and innovation of a sustainable society. The conference marked the beginning of an attempt by the Malaysian government to integrate the issue of sustainability into its 'Vision 2020' program. This seeks to ensure that Malaysia becomes a developed country by the year 2020. The concept of a sustainable society goes far beyond the concept of sustainable development, pioneered by the Brundland Commission. The conference in Malaysia also emphasised that the journey to a sustainable society need not necessarily be one of painful adjustment, but that it could also provide opportunities for those people who had the right mindsets.

Earlier, in 1991 I had assisted the government of South Korea to prepare for the 1992 Earth Summit. The mission-directed thinking of the South Korean government can be seen in this quote from the South Korean report to that summit:

> The biggest market of the future, and the biggest economic opportunity of the 1990s and the early 21st century, is likely to be the repairing, management and protection of the global environment in the interests of future generations of humans and other species ._._. [South] Korea ._._. aims to ensure that continued economic prosperity is built on an

> economic and industrial system which is appropriate for a middle level economy in a cleaner, greener and global era of the early 21st century. The challenge is to design the way to an ecologically sustainable future in the 21st century. This ._._. requires imagination and creativity to envision what is needed, and what an ecologically sustainable future might look like, and it also requires enterprise and organisational cohesion to achieve it. If [South] Korea can achieve this, it will be able to do both itself and the Earth a favour.

What a contrast to the problem-centred approaches outlined by many politicians from developed countries. Some outsiders perceive that the financial crisis of the late 1990s might cause South Korea to abandon this perspective. Such a view is usually advocated by media commentators and most cowboy economists, who continue to promote the idea that economic growth and environmental responsibility are mutually exclusive, and that only rich and prosperous nations can afford to have an environmental conscience. However, the South Koreans emphasise that there are opportunities for economic growth in the promotion of ecological sustainability. Like the Chinese, the Koreans use the same two characters to describe the word ‘crisis’—namely, ‘danger’ and ‘opportunity’.

There are similar programs in other East and South-East Asian countries. The issue of sustainability is now a major feature of the economic future of Papua New Guinea. During 1996 and 1997 I worked as a consultant to the Government of Papua New Guinea (PNG) on the KUMUL 2020 Program, which was funded by the United Nations Development Program. KUMUL 2020 is a vision for PNG in the year 2020. A significant component of the nation’s preferred economic future will rest on the implementation of a sustainable rural development strategy built upon, and celebrating, PNG’s uniqueness, including its ‘wildness’. Because PNG started later in its development journey than did most countries its ‘wildness’ is still largely intact. In particular, the strategy involves developing an economic base on the cultural and biological diversity of PNG. This will provide products and services for twenty-first-century markets on a sustainable basis. The strategy will include an ecotourism industry based on PNG’s magnificent birds, orchids, butterflies, rainforests, coral reefs and the marketing of foods drawn from PNG’s extraordinary indigenous flora. This rural development strategy aims to diversify PNG’s rural economic base whose vulnerability was shown in the disastrous 1997 drought when both stored food and cash income from the sale of crops were insufficient to support many rural communities.

Vehicles for creating Ecological Prosperity

The journey to an ecologically sustainable or ‘green’ future is a journey of imagination, design and innovation. A ‘green’ future will be created by concentrating on, and promoting innovations in, two broad areas:

- **‘green’ ways**—the values, ethics, beliefs, paradigms, behavioural patterns, customer preferences, and professional ethics and practices needed for an ecologically sustainable society;
- **‘green’ ware**—the designs, products, services and technologies which will be needed to realise an ecologically sustainable society.

Concurrent with the promotion of ‘green’ ways and ‘green’ ware is the implementation of policies for:

- the creation of ‘green’ markets in order to provide a domestic demand for ‘green’ ware which would then be exported to a world which is demanding it. Any country that wishes to show leadership in the development of ‘green’ ways and ‘green’ ware will need to ‘green’ its markets ahead of the rest of the world in order to provide a domestic market to nurture the development of these innovations.
- establishing new industries and enterprises to provide both the ‘green’ ways and ‘green’ ware needed to realise a sustainable society.

The Role of Government in Creating an Ecologically Sustainable Future

Even though governments have declining power in many areas, including in the setting and enforcement of environmental standards, they still have a major role to play. However, like communities they will need to do things differently. Primarily more attention must be directed towards making good environmental things happen rather than preventing bad environmental things happening. If any nation wishes to build a significant piece of its industrial future on the opportunities created by the journey towards an ecologically sustainable society it will, of course, need to develop a mission-directed strategy to do so. This will require mission-directed leadership from government. Most governments still have problem-centred environmental policies. The majority of these involve one or more of four issues: responding to emerging environmental problems such as pollution, regulating emissions into the environment, requiring assessments of environmental impacts of development proposals, dedicating new conservation reserves such as National Parks, and working to save threatened flora and fauna. Sadly, many if not most environmental groups also see their role as stopping undesirable and unsustainable development rather than imagining, designing and building desirable sustainable alternatives. Again, this is the result of a dominant problem-centred culture affecting all sides of the environmental debate.

A mission-directed strategy should first promote the development of ‘green’ markets through the promotion of ‘green’ ways through the education system and the media. This would involve the promotion of sustainable lifestyles, increasing customer awareness of what to look for in seeking ‘greener’ products and services. It would involve stimulating the professions, particularly the design-based professions, to develop responsible professional practices that promote sustainable outcomes, and educating finance organisations about the opportunities that are present in providing debt and equity finance to green innovators and entrepreneurs. It also involves slanting the market playing field to ensure that ‘green’ ware is competitive with its less sustainable competitors (‘brown’ ware). At present, the playing field often favours the ‘brown’ alternatives.

Governments will also need to recognise and modify the power of vested interests. At present, any attempt by governments to move the agenda towards sustainability is resisted by what can be called call the ‘vested interests of the unsustainable present’ (the ‘brown interests’): those who make the products and services which will decline in market share as the world moves towards sustainability. There are, of

course, vested interests which could be called the ‘vested interests of the sustainable future’ (the ‘green interests’). These interests are the producers of ‘green’ ways and ‘green’ ware. Most governments only regard environmental groups as ‘green’ interests. However, there are many emerging companies producing ‘green’ ways and ‘green’ ware which are also a part of ‘green’ interests. The more enlightened environmental groups are now forming alliances with these commercial organisations because they understand that a ‘green’ future requires a ‘green’ market-place. At present, the ‘brown interests’ are powerful and well organised and have enormous influence on governments. An example is the political polarisation which occurred in Australia when it fought against imposed reductions in greenhouse gas emissions. Excessive problem-centred thinking influenced many Australian politicians to view the proposed reductions as damaging to the interests of Australia’s coal industry, which was then misrepresented as the national interest. The goals adopted at the Kyoto Climate Change Summit in December 1997 require most developed countries (with Australia a notable and embarrassing exception) to reduce their greenhouse gas emissions to 5_per cent less than 1990 levels by the year 2010. Most experts agree that a 25_per cent reduction on current levels could be obtained by restricting large-scale clearance of native forests for agricultural and pastoral use, and a reduction in per capita energy use through improved efficiency. Any direct substitution of a renewable energy source over a non-renewable source, and any elimination of methane production such as through the elimination of landfills and the composting of urban waste, would improve this even further. Molecule for molecule, methane is thirty times more deleterious to climate change than carbon dioxide. There is already technology available to divert all carbon-based material from landfills and to transform it into top-soil and organic fertilisers. This is ‘green’ ware.

To give in to the interests of the coal industry is both short-sighted and foolish. Australia is attempting to prop up a nineteenth-century industry while ignoring the opportunities to create twenty-first-century industries. This will ensure that energy markets in Australia remain ‘browner’ than do global markets, or at least ensures they will ‘green’ more slowly than do global markets. By asking for a form of ‘protection’ for fossil fuel-based power generation while at the same time not resolutely pressing for a significant reduction in greenhouse gas emissions domestically, Australia is doing long-term damage to its future energy industries and to the development of innovations in energy which would build the pathway towards sustainability. Rather than ‘greening’ domestic markets ahead of global markets and thus providing support for new renewable energy approaches or for increases in energy efficiency, by keeping domestic markets ‘browner’ Australia is undermining the structural adjustment of its economy and industries towards sustainability. The result will be that Australian innovators will lose out to others who are treading a greener pathway into the future. Those who wish to become creators of the designs, products, services and technologies for a sustainable society receive little coherent support from the government. The creation of ‘green’ ware and ‘green’ ways, the creation of ‘green’ markets and promotion of the political power of the ‘green’ interests together form the ingredients of a new program and coalition for the creation of a sustainable society. This coalition will be a powerful, formative force to shape the next stage of structural change in Australian industry.

Governments should be implementing policies aimed at consciously promoting the ‘green’ interests over the ‘brown’ interests, probably through the formation of new

industrial groups to shape the new ‘green’ industries. At present, when ‘brown’ interests stop governments taking small steps towards the creation of a sustainable society they are actually undermining restructuring towards twenty-first-century viability. They are ensuring that the country will be a follower rather than a leader, an ‘also-ran’ rather than a beneficiary of change towards a sustainable society. They are also ensuring that others will obtain economic benefit by doing ecological good.

Some transnational corporations—for example, The Body Shop and Heinz—are operating out of enlightened self-interest. Both companies are marketing themselves by demonstrating their long-term commitment to a sustainable future. Heinz has adopted a policy to ‘make Australia and New Zealand an environmental oasis for Heinz’, thereby committing itself to growing clean food in these countries for global export. Heinz in New Zealand is already exporting organically produced food to Japan. Heinz is not only marketing what it grows now but what it wants to become in the future: the global leader in clean food, and it is inviting its customers to show their appreciation of its good planetary strategic intent by purchasing its products. This enlightened self-interest will have a much bigger global effect on the realisation of a sustainable future than any piece of regulatory legislation or tax incentive by an individual government. Government policy should be more about making good things happen and less about preventing bad things happening. Environmental policy in western democracies is mostly about the latter. Even debates about ecologically sustainable development concentrate primarily on stopping unsustainable development rather than on realising the sustainable alternative.

Designing and Innovating ‘Green’ Ware

Before we can convince people to use ecologically sustainable approaches to development, production, consumption and trade they must be given the option to do so as real alternatives, and not merely as imagined ones. The design-based professions have a very important role to play as they will design much of the sustainable world we are seeking to create.

In my own consulting work I ask engineers to imagine sustainable mining operations, transport systems and food production and processing operations. They are asked to avoid looking at current unsustainable production and development methods and practices—a classic problem-centred strategy. Instead I ask them to design strategies to realise sustainable products and services. At the 1993 World Architectural Congress thousands of architects spent several days living in the year 2020 in their imaginations and designing the buildings, structures and communities of 2020. Delegates were asked to imagine what a sustainable shopping centre or school would look like; they developed the design principles for sustainable buildings, structures and communities and new codes of professional practice for the future. One successful American developer said that he intended to be the first person to design and build a sustainable shopping centre—he could appreciate the market advantage in doing this.

There are now many approaches to assist a professional person who is seeking to create an ecologically sustainable form of development or production. These approaches are all part of a rich body of ‘green ways’. One of these is the Swedish

design process called the ‘Natural Step’ that was conceived by Dr Karl-Hendrick Robert, a Swedish cancer specialist, who was concerned at the rising incidence of environmentally related childhood leukemia and the fact that global debate about causes and priorities for action was ineffective in preventing an increase in morbidity and mortality from this form of leukemia. He developed a simple set of four principles to guide sustainable development:

1 Substances from the earth’s crust must not systematically increase in the ecosphere (the zone of the earth’s crust, land, water and air wherein life exists).

2 Substances produced by society must not increase systematically in the ecosphere.

3 The physical basis of productivity (soil, air, water and nutrients) and the diversity of nature must not be diminished systematically.

4 The use of energy and other resources must be fair and efficient with respect to meeting human needs.

The ‘Declaration of Interdependence’ from the World Architectural Congress is a guide to professional practices and ethics, and a list of state-of-the-art design rules to realise a sustainable future. It is a set of design rules for the creation of ‘green ware’ and a set of professional ethics which are part of ‘green ways’.

Professor Bill McDonough of the University of Virginia and his associates have developed a set of principles for sustainable design called the ‘Hannover Principles’. These have been developed to guide the design and innovation processes for a sustainable future and as guidelines for the Hannover 2000 Expo—the World Fair for the year 2000—which had as its theme ‘Humanity, Nature and Technology’. This Expo was a major signpost on the journey to a sustainable future and provides an international showcase of innovations: designs, products, services and technologies for sustainability. The Hannover Principles:

1 Insist on the rights of humanity and nature to coexist in a healthy, supportive, diverse and sustainable condition.

2 Recognise interdependence. The elements of human design interact with and depend upon the natural world, with broad and diverse implications at every scale. Expand design considerations to recognise even distant effects.

3 Respect relationships between spirit and matter. Consider all aspects of human settlement, including community, dwelling, industry and trade in terms of existing and evolving connections between spiritual and material consciousness.

4 Accept responsibility for the consequences of design decisions upon human wellbeing, the viability of natural systems, and their right to coexist.

5 Create safe objects of long-term value. Do not burden future generations with requirements for maintenance or vigilant administration of potential danger due to the careless creation of products, processes or standards.

6 Eliminate the concept of waste. Evaluate and optimise the full life-cycle of_products and processes to approach natural systems, in which there is no waste.

7 Rely on natural energy flows. Human designs should, like the living world, derive their creative forces from perpetual solar income. Incorporate this energy efficiently and safely for responsible use.

8 Understand the limitations of design. No human creation lasts forever, and design does not solve all problems. Those who create and plan should

practise humility in the face of nature. Treat nature as a model and mentor, not an inconvenience to be evaded and controlled.
9 Seek constant improvement by the sharing of knowledge. Encourage direct and open communication between colleagues, patrons, manufacturers and users to link long-term sustainable considerations with ethical responsibility and re-establish the integral relationship between natural processes and human activity.

McDonough added the following explanation to the document:
The Hannover Principles should be seen as a living document committed to the transformation and growth in the understanding of our interdependence with nature, so that they may adapt as our knowledge of the world evolves. These principles have been adopted officially by the City of Hannover and are being used by design-based professionals, particularly in North America, Europe and Australasia.

The principle of *living within perpetual solar income* first comes from R. Buckminster Fuller. *Turning waste into food* recognises that in nature there is no such thing as waste. The waste/ excrement form one species is the food for another. We must not just reduce waste (a problem centred approach) we must abolish it (a mission directed approach).

In the October 1998 issue of *Atlantic Monthly*, McDonough and his colleague Michael Braugart distinguished between 'eco-efficiency' and 'eco-effectiveness'. The authors maintain that the concept of eco-efficiency is a dangerously flawed concept. Eco-efficiency is a problem-centred approach which involves lessening undesirable outcomes such as minimising pollution and waste. Eco-effectiveness, on the other hand, is a mission-directed approach, which involves designing a world where these problems do not exist at all because they have been designed out. Eco-effectiveness would abolish waste not minimise it.

Seeking Elegant Design Solutions: Avoiding Collateral Damage

We need other new design rules besides important one such as 'living within perpetual solar income' ,or 'turning waste into food'. If we are to coexist in our Planetary spaceship, we need to find some ways of acting in ways which do not endanger the viability of the spaceship.

Many of our current unsustainable approaches are due to the fact that many first generation approaches are too gross and not subtle or precise enough—a sort of bull-in-a-china-shop approach to doing things. A sustainable future will require both elegance . precision and subtlety in design. This approach to sustainability is best seen in terms of the military concept of collateral damage: not being precise or subtle enough, and because of lack of precision or lack of knowledge, one causes accidental and unintended damaging impacts as well as intended impacts. Sustainability therefore can be thought of as acting in ways which create no collateral damage.
We can borrow the concept of just-in-time (JIT), which is a major design principle of modern manufacturing and retailing, and apply it to the creation of a sustainable world. After appropriate modification this concept could be called 'just-enough-in-place-and-time' (JEPT).

Let me illustrate with a few examples: in the field of medicine, chemotherapy is a very gross, unsubtle and unspecific approach to the treatment of cancer. The whole body is literally poisoned in order to kill cancer cells in one part of it. The side effects (or collateral damage) of this treatment are considerable and many non-target cells are destroyed. More modern methods involve the use of customised monoclonal antibodies designed specifically to recognise a particular malignancy, which carry specific toxins that target and kill the cancer cells without endangering the rest of the body. This package of poison is delivered to the exact place where it is needed, at the right time and in appropriate concentrations.

In agriculture, pesticides are used to kill specific pest organisms, but because these pesticides are not specific for a particular pest and are sprayed indiscriminately on a crop they threaten many non-target organisms, as well as the people using them and often people quite distant from the spraying if the pesticides are carried by water systems or biomagnified in food chains. This is environmental and health collateral damage**.** Modern, more sustainable approaches will use genetically engineered plants containing a gene that is specifically lethal to the pest, as in the case of the BT gene for the Boll worm (Heliothis) in cotton. The BT gene in cotton has its critics, nevertheless the principle of using gene manipulation is sound and very subtle. The BT gene based on transferring material from a bacterium called a Bacillus into cotton is only the first generation of what will become a very subtle and precise form of biological control in future years. The agreement in Toronto in January 2000 to regulate the movement of genetically modified organisms (GMOs) in international trade is a sensible response to real concerns that some genes could escape into nature and cause both health and environmental harm. However, it is silly to regard all forms of genetic modifification as dangerous. There are huge and exciting possibilities for the use of GMOs to create benefits, both for people and the environment. Provided the precautionary principle is used intelligently it should be possible to obtain an intelligent balance between the demands of the technophiles and the technophobes, for the benefit of both people and the environment. Other forms of biological control, such as parasite or predator control,
Chemical fertilisers are added to the soil in large quantities to increase plant production but only a small proportion is taken up by the plants. Much, indeed most of it, is rendered insoluble and is locked into a ‘safe’ in the soil and is therefore unavailable to the plant unless it is remobilised in a soluble form by soil micro-organisms. Some of the remaining fertiliser increases the osmotic stress and therefore the water availability to the plants, kills off the earthworms and generally reduces the soil from a living system to a mere physical structure to hold up the plants. The rest of the fertiliser is washed away by rain and causes major eutrophication (pollution by over-nutrition), another form of collateral damage, and therefore, pollution of water resources, resulting in algal blooms, the destruction of fisheries and, in tropical oligotrophic (nutrient-poor) marine systems, the destruction of coral reefs.

A more sustainable approach involves organic and biodynamic agriculture and horticulture, which is a form of JEPT plant nutrition. In organic and biodynamic production mineral fertilisers are converted by biological (microbial) systems in the soil into available nutrients at just the correct rate and in the correct place in

the plant's rhizosphere, the zone adjacent to the plant's root hairs which take up water and nutrients, while avoiding an excess of soluble nutrients which would be washed out to pollute water resources. Even the insoluble fraction of nutrients in the soil can be mobilised by soil microbes which, in essence, provide a combination to the nutrient 'safe' in the soil, thus enabling the plant to gain access to these nutrients. This involves returning to agricultural patterns that were in use before the invention of chemical fertilisation, but adopting them by using high technology and in a very subtle way.

The same situation exists in the area of energy. Electric power is produced at large, centralised generating facilities (coal-fired, nuclear, etc.) that all produce unacceptable waste levels and thus violate the sustainable living design principles. Our use of fossil fuels is changing the climate by the production of greenhouse gases and, of course, nuclear waste produces an intractable waste management problem. There are numerous alternatives to such approaches. Some of these can continue to utilise the same electricity delivery networks while incorporating over time energy production inputs from renewable sources to replace the existing fossil fuel resource base. Gradually there can be a slow addition of these renewable units as large fossil fuel or nuclear sources reach the end of their life cycles. In several parts of the world, including Australia, customers can nominate that some or all of the electricity they purchase should be 'green' power provided from renewable resources. This power costs more and the additional funds are used to add renewable energy sources to the grid to respond to growing demand. This is an example of people with 'green' ways 'greening' the electricity market, and of 'green' ware being added to supply this 'greener' market demand. It is claimed that in large high-demand grid systems there will always be a need for some non-renewable/nuclear energy. It is true that most current renewable sources are small in scale and not appropriate in current energy-intensive systems. However, this is a reflection of the domination of 'brown' interests in the intensive energy sector, and their unwillingness to examine 'green' alternatives. Some sources which are renewable can be very large and are very suitable for adding to large grid systems, including wave and tidal power, hydro and OTEC (Ocean Thermal Energy Conversion) which is based on generating power from the temperature differences between the ocean's surface and ocean's depth. There are others which are long-lasting and not climate threatening though not strictly renewable. These include geothermal systems based on both volcanic heat and so-called 'hot rock' systems, which utilise energy generated by piping water beneath the earth so that it passes through rocks containing naturally occurring nuclear radiation.
In situations where energy use is not so intensive, renewable approaches can be very viable. Some of these can be totally autonomous, not requiring connection to the power grid at all. These can be based on JEPT production and consumption systems of solar/electric, solar/thermal or solar/hydrogen, micro hydro, wind power and many more options. Many systems can use solar-generated electricity to split water to produce hydrogen which is then sent to the point of consumption through already existing gas pipelines, and reconverted into electricity JEPT through the use of fuel cells, or burned thermally where heat is required. The options are almost endless. However, it is very difficult to overcome 'brown' interests and problem-centred politicians and bureaucrats who are vulnerable to political pressure being exerted by 'brown' interests.This means that all of these options have to struggle to get the recognition and research and

development expenditure they deserve. In this case the increased recognition of collateral damage caused by the use of fossil fuels is due to the fact that we have greater knowledge. It is not caused by a lack of precision as it is impossible to burn fossil fuel without releasing carbon dioxide, although it is theoretically possible to prevent this release to the atmosphere through a series of technological approaches, such as by utilising algae or other plants to absorb carbon dioxide and to produce food. We now know a lot more about the impact of carbon dioxide on climate change, and we can now appreciate a form of collateral damage which we did not recognise a few decades ago. The discovery that chloroflourocarbons (CFCs) were obliterating the stratospheric ozone layer is a similar story. Environmental folk lore is full of such narratives and this emphasises the fact that ignorance can be just big a cause of environmental problems as are malevolence and greed.

In the last decade 'green' power is now a real option which is moving from the margins to the mainstream in developed countries; despite the continued pressure from 'brown' interests an undermining of 'brown' political power has commenced. Electricity providers are recognising that they have to service this expanding market demand for 'green' power or lose market share to competitors who are prepared to
provide it.

A final example of JEPT can be seen in the defence and security area. Traditional warfare involves the use weapons of mass destruction and involves substantial or even immense levels of collateral damage. These weapons do not distinguish between true adversaries and innocent members of the enemy population. The 'smart bomb', in theory, is designed to precisely remove the threat, the enemies and their war machine, but not damage others who cohabit on the spaceship, or the spaceship itself, and therefore to cause no collateral damage. Like all new technologies it is still relatively primitive, and it will become more precise in the years ahead as security replaces defence as the core concept for dealing with twenty-first century threats. However it is clear from the kind of war fought by NATO against the Serbs in late 1999, that collateral damage, in terms of both innocent human lives and unintended physical damage, is minuscule compared with earlier decades of the twentieth century, when mass destruction first became a serious possible consequence of war. The development of global positioning technology has permitted the creation of precise weapons delivery unimaginable a couple of decades earlier. The threatening scenarios of nuclear winters and global destruction resulting from the collateral damage of mass nuclear weapons exchanges have become much less likely in just two decades. This is not only because of the end of the political and ideological confrontation of the cold war, but also because more precise warfare technologies have been developed which are aimed at minimising and presumably ultimately avoiding, collateral damage. One of the main worries of those who are concerned with nuclear proliferation is that some cowboy-led countries are still interested in developing nuclear weapons which are still aimed at causing mass destruction, rather than in creating 'smart' precision weapons that are aimed at achieving their ends while avoiding collateral damage. We are getting nearer to the era where it will be possible to remove serious cowboy threats to the security of the spaceship without endangering the cosmonaut

population or the spaceship itself. This is an example of how cosmonaut security technologies are replacing cowboy defence technologies.
All of these examples of JEPT achieve a desired outcome in a complex interconnected system while leaving the system intact and undamaged. This should be a design rule for sustainability. We are all living in a spaceship and we are all connected with its systems. We must seek more and more subtle ways to get what we want in ways which minimise collateral damage.
To achieve sustainability we will need very subtle ways of intervening in complex ecosystems. Many of these ways will use advanced technology such as cybertechnology, biotechnology and nano-technology. The challenge for innovators throughout the world is to intervene purposefully without endangering the functioning of these systems.

Industries and Enterprises for the Creation an Ecologically Sustainable Society

The mission to design and innovate an ecologically sustainable future will provide huge opportunities to those with the vision, imagination and enterprise to design the 'green' ware and 'green' ways to realise it. This will not only involve creating the 'green' ways and 'green' ware, it will involve the creation of whole new industries.
Some of these future industries will be: the 'earth repair' industry, which restores and rehabilitates degraded, polluted or even obliterated ecosystems such as rainforests, coral reefs and rangelands, and their soil, water and biotic components when they have been degraded by development such as mining or by over-exploitation. This industry also rehabilitates degraded and contaminated urban areas, polluted lakes and rivers, seas and airsheds. The restoration of rainforests is one element of the 'earth repair' industry, one of the biggest industries of the twenty-first century. It could also be seen as the 'spaceship maintenance' industry.

Scenario: The year is 2010. The Chief Executive of Rainforest Restoration Ltd, which has its world headquarters in Cairns, receives a phone call from the Prime Minister of Malaysia. The Prime Minister says: 'We have cut out almost all our rainforests in Malaysia. I should have seen the signs in the 1990s, when it was clear that global appreciation of rainforests was increasing, but the actual amount of rainforest resources was rapidly diminishing. We, in Malaysia, made a terrible mistake when we cut out so much of our tropical rainforests in the 1980s and 1990s. We would like to have a significant proportion of our rainforests restored to where they used to grow, and particularly to the Malayan Peninsula. Could you do this for me?'
The CEO indicates to the Prime Minister that she will send him a proposal which will totally restore rainforest to the areas in question within twenty years, and that she will send one of her experts to Kuala Lumpur immediately.

The 'environmental survey' industry assesses, monitors and audits ecosystems. This industry works from the macro level (such as from space through the use of remote sensing), through to micro and nano levels (for example, surveying contamination at molecular levels). The industry provides instant, detailed information and management knowledge relating to forests, fisheries, wildlife and other biota, and the management of atmosphere, seas and fresh water resources, soil and land.

Scenario: The year is 2006. The Earth Marine Survey Corporation, with its headquarters in Singapore, which is working under contract for UNEP and FAO as part of the 'Earth Watch' program, informs these organisations that its satellites have picked up a ship dumping toxic waste in the international waters off the Cook islands, and that a pollution plume is endangering tuna fishing stocks. This corpoation has been surveying the South Pacific in all of its aspects for a number of years, and is responsible for managing the South Pacific Environmental Data Base of the Earth Environet system, which is , in turn, part of Earthwatch . Earthwatch is the responsibility of a consortium of a number of UN agencies including, but all its programs are contracted out to the private sector. There are many environmental survey companies that are vigorously competing for business in this rapidly growing economic sector. The documentation of the Marine Survey combined with ground sampling taken by the South Pacific Forum Environment Protection Agency is used to prosecute the toxic waste dumper in the World Environmental Court, which is part of the International Criminal Court in The Hague, and which was established in 2000.

The 'resource renewal' industry is dedicated to working towards the complete elimination of waste. In approaching most waste issues the majority of governments and companies work with problem-centred strategies aimed at reducing waste and sequestering it so that it cannot threaten people and ecosystems. This ignores the big opportunities which exist from the mission-directed design and innovation of systems which totally eliminate waste. On a spaceship there are no receptacles to hold waste indefinitely otherwise the spaceship and its inhabitants would gradually be poisoned. There is no waste in nature: the waste of one species is the food of another. The resource renewal industry facilitates the reduction in use, and the re-use and recycling, of resources and the management of wastes. It seeks to mimic nature and turn all waste into food or resources for further use.

Scenario: The company Universal Greening Organics was established in 2000 with the aim of turning all urban organic waste into top soil. Top soil, of course, was in very short supply and very little of high quality was being created. This company separates unsorted municipal solid waste, recycling all the non- organic fractions and composts the organic fractions. It composts sewage sludge and organic matter from a diverse number of industries, including pulp and paper, food production and abattoirs and tanneries. All this material is combined with mineral fertilisers and soil microbes to create top soil *in situ*, when and where it is needed. The same processes are also used to rehabilitate degraded land and land that is being repaired after development. As such, Universal Greening Organics is a member of both the Resource Renewal Industry and the Earth Repair Industry.

This scenario differs from the previous two scenarios, in that it is already happening. I am the Chairman of Universal Greening Group!

The 'sustainable energy' industry researches, develops and markets those energy products, services and technologies which are based on the utilisation of renewable resources, and continuously improves energy conservation and efficiency. Its aim is that, by about the year 2020, all major processes will be able to operate within the energy limits imposed by solar income. It also aims to steadily increase the proportion of energy drawn from renewable resources.

The ‘sustainable communities and cities’ industry involves the design of sustainable communities, including the evaluation of the basic health and wellbeing needs of people living in urban areas. A guiding science for this industry is human ecology, which integrates the work of the architectural, building, industrial design and planning professions in the design and construction of sustainable schools, shopping centres, transport systems and houses.