INTRODUCTION (*1)
The Ecology of Conscience –
Sustainability Issues for New Zealand by Michael Tobias

By ecological analogy with most other countries and regions New Zealand achieves extraordinarily high marks: for its awareness of, and virtual consensus on the importance of conserving native species, 14 national parks, the first, deeded by Maori to the country, and countless subsequent reserves, even an attempt to convert all of Antarctica into a world park. Conservation lands now account for some 30% of the nation. Its Department of Conservation has long pioneered the highest international standards for ecological restoration, particularly on many of the nation's 700 or so islands, beginning with the first wildlife ranger, Richard Henry, in the late 19th century, and continuing with such scientists as Don Merton by the early 1960s. In addition to relishing landscapes –in art, culture, science and the everyday, New Zealanders vouchsafed a nuclear free nation, and one of the first environmentally-based political parties, the Values Party in 1972. With its small population of 4 million human residents, the country can look forward to a relatively green future.

But that is not to say that "clean and green" translates the same for all people. The country can by no means afford to rest on its laurels. It has sold the world on an eco-tourism mantra of clean, green, 100% pure, but there are remaining trouble spots which this address modestly considers, the responses to which constitute numerous challenges: They include an astute approach to sustainable, renewable energy; best environmental practices in every facet of land and water use; a natural capitalism that rewards compassionate conservation while proffering no-nonsense disincentives for imprudent exploitation; an economy, in conjunction with the Resource Management Act, that is serious about conserving cultural traditions whilst impeding further erosion of its biological heritage; that soberly accounts for, and strives to rectify ecological depreciation and destruction. A society that will collectively embrace –in its many complex guises- the highest possible standards of animal welfare, whether in deliberations concerning non-native species or in the exploitation of animals out on the farms, across the land and in the water. All of these necessary trends should translate into an eco-economy whose industrial processes and by-products, imports and exports, aspire to an ecological ideal; a quality of life for all concerned that is understood to exist *inside*, not *outside* nature. And whose paramount objective should be an environmental ethic that will imaginatively envision, and speak honestly to future generations with the same loving attention that has been lavished on Takahe, Tuatara, Black robin and Kakapo.

In this discussion I examine several key arenas, each of which form a critical aspect of any truly sustainable vision, from human demographics and their subsequent pressure on the environment and biodiversity in particular, to socially responsible investing, the hotspot concept and its applicability to New Zealand, eco-tourism and animal welfare concerns.

Tihei Mowrree-ora! (Behold the breath of life!)
Ennga mana… (The privilege)

Ennga iwi! (The people)
Rau Rangatira-ma! (And all the chiefs here)
Tena Katou, Tena Katou, Tena Katoo…

The Ecology of Conscience & Some Basic Concerns of Sustainability
How does one integrate sustainability and human conscience? Philosophers have long debated the human penchants for peace, for violence, for self-interest and for kin altruism. People are many things, of course. I'm mostly a vegan, but I also wear cotton, consume genetically modified corn and soy, receive gladly a household worth of electricity from a big-city coal-fired grid, and spend a considerable amount of time in airplanes and automobiles with leather seats, adding my indecent fraction to global warming and to the incremental demise of the very ecosystems and creatures I would profess to love. (*2) And I am based in Los Angeles where there are said to be more environmentalists, lawyers and psychiatrists per square mile than in any region in the world.

Seven years ago a group of economists figured out that the biological world provides approximately $33 trillion dollars each year in free services. (*3) If municipalities had to pay for such services, we'd all be bankrupt. That's one way to look at the value of conserving nature. And not a bad way, either. Because not too long ago taxpayers in New York City saved $9 billion dollars over the course of a decade by simply restoring a few watersheds in the Catskills to their original integrity, more or less, as opposed to building several expensive water purification plants.

There are plenty of formulas for exerting a life-saving light-handedness. (*4) But no planner, scientist or activist can afford to ignore what Sir Crispin Tickell has termed "the scandal of unsustainability." Sir Crispin –and tens-of-thousands of others around the world- have pointed to several crucial corollaries of sustainability which are faltering, namely: valuing natural services (appreciating both the economic and inherent values of biodiversity), slowing down population growth, re-envisioning the urban maelstrom, the implementation of smart alternative energy sources, environmental auditing, the institutional embrace of socially responsible asset allocations, the targeting of overseas aid at sustainable projects (as the World Bank has finally begun doing), the examination of a full range of techniques, both locally and globally, for mitigating the imbalance of greenhouse gasses, and -most importantly, the recognition of the preciousness of all life. (*5)

I have thus adopted "the ecology of conscience" as an organizing principle for not only looking at the turbulent world in a hopefully instructive way, but offering up a cafeteria-style, socially caring paradigm that is at once practical *and* idealistic. Practical and idealistic. How is it possible? (*6)

Section 5 of the *Resource Management Act* refers to the "avoiding, remedying, or mitigating any adverse affects on the environment." The RMA also commends non-material benefits of conservation. That is one way of pairing pragmatism and idealism. That said, it is precisely those material benefits and market forces that have largely

dominated the natural world in country after country. As of 1999, nature-based by-products accounted for over 33% of New Zealand's exports. (*7) Between 82 and 85% of New Zealanders live in towns and cities, largely cut off from the source of such income generation, versus a global average of 50 per cent rural versus urban. This increasing distance of the majority of the populous from the source of its wealth mirrors other mismatches, what some might term "moral tensions" and we see it in the rapidity of change affecting the demands of consumers. In the past two decades, New Zealand's population has increased by 19% while its energy use has risen some 61%. Similar surges are evident in every sector, from construction to waste disposal. (*8) Worldwide, the average national amount of land given over to pasturage is 23%. In New Zealand, that figure skyrockets to 52%, which connotes a whopping ecological trade-off. The Southland's riparian water pollution issues are just one example of the fall-out.

The Biological Bottom-Line

But it is within the biological arena where the domino-effect of natural resource extraction, non-native predation and habitat loss have shadowed one of the most isolated landmasses in the world, rendering New Zealand a national hotspot, in the jargon of biologists, not unlike Madagascar, Southern California or Japan. A nation, in other words, where vulnerable species and human development are in fatal combat. (*9) There are 33 other hotspots in the world, so far designated, and collectively they account for approximately 2.3 percent of the terrestrial planet, a number that should be viewed with some optimism in that it provides a mechanism for targeting scarce dollars at that representative suite of biomes where every dollar can do the most good for conservation. But at ground zero New Zealand's biological disarray is particularly distressing, given the country's relatively diminutive size and population and the –biologically-speaking- recent fact of the country's extinctions. (*10)

Once there were 230,000 square kilometers of forest in New Zealand. Today, about 35,000 sq. kilometers remain. Because of the country's high rate of endemism, of species and several biological families found nowhere else on earth, the human appropriations have come with a terrible price. The most recent Department of Conservation Minister's Report lists 2,373 plant and animal species, from fungi to blue whales, that are at some risk of extinction, and 312 that are critically so. "Endangered" refers to a rate of decline of 80% within a decade, or fewer than 250 adults remaining, or a species with less than one hectare of territory. (*11) 61% of the birds in New Zealand, and at least half of all endemic vascular plants, are threatened. One endangered species for every 1685 New Zealanders, approximately. Ecosystem change in New Zealand has brought the country down to less than 22% of its original native habitat. (*12)

Such alterations hammer home a serious summons: Is an ecology of conscience even possible at the national level? The question haunts every nation, rich and poor alike. There are reasons to be optimistic. Ever since Plato lamented disappearing watersheds across the Mediterranean, and –much later- the North American Chief Seattle spoke eloquently of our not inheriting the earth from our ancestors, but borrowing her for a short time from our children, many have come to recognize a duty upon all of us in the name of compassionate sustainability. And when I tell you that New Zealand has a

chance to lead the way, I am neither dreaming nor underestimating the challenge. Much of that logic hinges on two points: one, few New Zealanders are unaware of the crisis affecting wildlife and water quality, and secondly, with a population of 4 million, New Zealand's demographic drivers –the so called IPAT equation formulated in 1994 by Dr. Paul Ehrlich (Impact = Population x Affluence x Technology) relative to the size of the nation- might just be manageable. (*13)

Demographics

But the emergent formulas are not without deep divides and uncertainties domestically, and –in the global arena, there may a very conversation of the deaf at work in the modern world. In preparing this talk, I was asked to attempt to relate New Zealand and her quest for sustainability to countries elsewhere in the world. For starters, by comparison, take the population here in Southland –fewer than 100,000 people. The same number of newborns in Southern California last year. (*14) Also the same number of forlorn castoffs bulldozed in a matter of days from their slum dwellings in New Delhi in January of this year to make way for a new shopping mall and fast food joints. India's 1.1 billion people are slated to reach 1.6 billion by the same time New Zealand's population reaches a refreshingly *low* 5 million, around 2050. Demographics matter. (*15) As reiterated in this year's **State of the World** report, "all the world's ecosystems are shrinking to make way for humans and their homes, farms, malls, and factories." (*16) The list of endangered species, of fisheries, soil erosion, habitat loss, and so on has become dismally familiar to all of us. (*17) Meanwhile, approximately a trillion dollars of unsustainable subsidies are handed out by governments annually. (*18) Nearly every region of the planet reveals high levels of threatened endemism across virtually the entire taxonomic spectrum.

Like India, China's population will reach 1.6 billion consumers in this century. With over 400 billion dollars in cash reserves, all the gains that might be made in CO2 emission controls in the West could be nullified by China, as she adds 11,000 automobiles to her highways every day. That is, unless her newfound commitment to alternative energy matures quickly. (*19)

More than 55% of all nations have yet to achieve fertility replacement. Osama Bin Laden was the 17th child of a man with 11 wives and 55 children. (*20) But there is an even grittier lurking reality, namely, the fact that smaller families may mean more Western-style consumption. We're seeing it in China. This is an ecological paradox for which no answer, as yet, exists, accept to acknowledge that the population explosion is defined by its impact, which, in turn, revolves around the manner in which wealth –to whatever degree- is expended. Money spent wisely, sustainably, can be a great force for nature, and for human and other animal rights. And even in New Zealand, those 4 million individual choices add up, for better or for worse. Cumulative largesse plays a dominant role in this fertility scenario. How much generosity, and species altruism is actually in order? Are there limits? How do policy planners prioritize in the international arena? It would take approximately 17 billion dollars per year to shore up the gaps in family planning, as outlined at the 1994 U.N. Cairo Conference; $24 billion per year, it is believed, to end hunger; $21 billion per year to conquer AIDS and ensure universal health care; another

$1.4 billion per year to guarantee that every child be properly immunized. Instead, our fast growing human population spends some $400 billion per year on cigarettes, $40 billion on diet aids, $250 billion on advertising and, just in the U.S., $518.9 billion in the year 2002 on the military. (*21)

Given this blitzkrieg of large fiscal anomalies and appeals, does a small country like New Zealand have responsibilities to anyone other than her own people and natural habitat? Today's nations must not only think and act locally and globally, both; but learn from one another's successes and failures. (*22)

Comparative Ecologies

Comparisons are unpredictable, however. Other regions of low human population have also resulted in demonstrative effects upon indigenous biodiversity –from the UAE with 54 endangered species, to Cuba with 225; Costa Rica with 293 and wealthy Luxembourg with 69. (*23)

The bodies of Arctic Greenlanders, particularly the indigenous Inuit, show –"the highest human concentrations of industrial chemicals and pesticides found anywhere on Earth"; "levels so extreme that the breast milk and tissues of some Greenlanders could be classified as hazardous waste." (*24) In a territory of but 53,000 inhabitants there are 48 endangered animal and 2 plant species. Moreover some 50% of the population endured violence to their person, and 33% of women between the age of 18 and 24 were sexually abused last year. (*25) If all that weren't bad enough, Greenland is melting. (*26)
It is clear that a low population, by itself, is no guarantee of sustainability. Look at the sorrowful human history on Easter Island. Or nearby Tasmania – 500,000 people, 50 of whom could rest in the 500 year old hollows of the largest flowering trees in the world, *Eucalyptus regnans*, which are being systematically clear-felled. And this, despite the fact that Tasmania saw the first Green party candidates in the world running for election, as well as public opposition by 85% of all Australians to the logging. (*27)

The U.S. has even fewer guarantees: America could number half-a-billion by mid-century. Try wrapping your brain around all those SUVs. Not a pretty picture.

California, six times larger than Tasmania, with its 36 million people, likely to exceed 60 million within half a century, is a case study in the unruly relationship of demographics and ecology. Back in 1994 *Proposition 187*, as it was called, sought to remedy increasing problems by pointing the finger at illegal immigrants, who now number 2 million; and cutting off all humanitarian assistance to them. (*28) This ballot measure was rejected by the courts though some politicians are presently arguing for an open border between the U.S. and Mexico, and people continue to pour into the region. Many of the difficulties afflicting the Golden State whose mascot, the Grizzly Bear, went extinct in California in the early 1900s- come down to demographic pressure and its resulting runaway development and consumption. (*29) A few years after the groundbreaking 1972 U.N. Stockholm Conference on the Environment, California's youngest governor ever was elected, Jerry Brown, a 36-year old idealist. (*30) In the spirit of the just released Club of Rome report –**Limits to Growth**- young Brown declared a new era of sustainability for

California. No new infrastructure, no new nuclear power plants, hydroelectric dams or new overpasses –just maintaining what was there. Sadly, it didn't check the flow of immigrants. People continued to flood into the most populated state in America, each seeking his and her own fantasy-land. And now there is truly a weakened infrastructure to cope with these huddled masses, and billions of dollars of debt. Brown –presently mayor of Oakland California, California points out that whatever capitalism can or can't do, one crucial caveat remains clear: "The economy is inside an environment – the environment is not inside an economy." (*31) California's population pressures resound in stark biological terms, a grim environmental profile: unsustainable water uptake, dying trees, fire, and further relaxation of laws protecting the countless endangered species. (*32) The ramifications escalate. (*33) In a state that otherwise prides itself on the ecological cutting-edge, only 2.2% of L.A.'s electricity comes from renewables. The rationale: officials say that the 2-to-4 cents a kilowatt hour makes coal ten times cheaper than solar.

Across Europe and Japan legislation has been working for over a decade to revitalize their environmental commitments by compelling responsible manufacturing, whether of cans, packages, bottles, or entire automobiles. (*34) The European Parliament's 44 Green members, met in Rome in mid-February of 2004 to hammer out a set of consistent priorities that would give them a more effective voice, focusing on "food safety, sustainable development, the fight against nuclear power and genetically modified organisms, and support for the Kyoto Protocol." This latter issue has already been long endorsed by the EU. And most recently Russia has endorsed its ratification across Europe. (*35)

Russia has other problems that are only too symptomatic of the rest of the world: wildlife poaching and animal cruelty, a lack of environmental policing, and a vast dependency on fossil fuels which, according to the World Bank is "three times" greater than Russian officials are admitting to. (*36)

Energy is not on many New Zealanders' radar screens either. According to last year's Metro Auckland Poll the things that worried residents most were (in order of importance), congested roads, general crime and violence, air and water pollution, race relations, rising prices for homes, and population growth. An enviable 1% evidently had no anxieties whatsoever. (*37)

Immigration debates surfaced in the Auckland poll, but an additional changing demographic profile also stalks New Zealand's sustainability future, and it hinges on the reality of a declining work force, based upon low fertility rates, at the very moment that the developing world is producing hundreds of millions of newborns. As countries like New Zealand see their populations age, they must either increase the inflow of skilled immigrants, or provide a robust "offshore outsourcing destination of high value," such as IT, film. (*38) "If we could create several thousand jobs simply by creating a tax break for *The Lord of the Rings*, why aren't we coming up with an idea like that every month or two?" asks Paul Loof of Watson Wyatt NZ. (*39) But what about a New Zealand Conservation Corps?

The Sustainability Revolution

Of course, for many years New Zealand *has* acknowledged, and increasingly embraced the sustainability and conservation revolutions. (*40) In Southland, two district councils have endorsed the zero waste concept. (*41) The RMA provides that local councils may look closely at the benefits that resource consents for renewable power might bring about. (*42) In New Zealand's bid to reduce carbon emissions, 46 organizations put in applications for the 4 million emission units being offered in 2003. There will be those who argue that the country is still largely wedded to fossil fuel dependency. Most countries are. (*43) But there is a compelling prospect for renewables. Consider that in the mid-1990s, worldwide expenditures on renewable power was around 6 billion dollars, and only 3 fuel cell companies existed, while today, over 17 billion dollars are being expended on alternatives and there are over 300 fuel cell companies. Hydrogen, and fuel cells, are ultimately, one critical corollary in the puzzle of solving a burgeoning human population's energy needs. The other, of course, is less consumption, and lives that adapt to a fellowship of non-violence, meted out in terms of simpler lives, humbler lives, less taxing lives. The Icelandic Minister for Industry and Commerce sees her country as the leader in this renewables revolution. But so too does Vanuatu. 80% rural, Vanuatu expends 90% of its export revenues on oil. The Prime Minister Edward Natapei now sees the nation's geothermal reserves as key to producing hydrogen to solve his country's energy needs, leaving much of it left over for foreign sale. Every auto manufacturer is looking at hybrids and at hydrogen. Every building and parking lot could, in time, become a mini-power plant. All of the world's 750 million automobiles could feed energy back into an energy Internet during their down-time, thus forever eliminating vulnerable centralized energy grids, with their increasing black-outs. (*44)

Hydrogen surely pairs idealism and the pragmatic, but there are, in addition, other steps along the path to sustainable energy economies. Lester Brown's recent book **Eco-Economy**, a huge array of such critical transitions from ecologically destructive policies to affirmative ones are detailed. (*45) He cites Denmark as having come closer than any other developed nation to balancing its carbon emissions and fixation through intense bicycle usage, the banning of coal-fired power plants, and its widespread use of wind power, which provides 15% of its grid. Indeed, says Brown, in the wind power sector, the growth rate has risen fourfold worldwide in the last 5 years, second only to the computer industry. From France to India, sustainable wind power has arrived. Brown sees farmers and ranchers turning profits on a quarter-acre of land to the tune of $2,000 US per year with wind turbines that, in turn, supply the nearest community with the equivalent of $100,000/year in electricity.

Moreover, unused capacity is then able to be stored as hydrogen for generating electricity later, on demand. (*46) From photovoltaic cells, to bio-architecture, humanity is poised to re-align imbalances dating back centuries. Germany, which recycles 72% of all paper, has pioneered tax-shifting while the US has slowed down its soil erosion by 40% since 1982. Holland has embraced the bicycle for urban life. Costa Rica is well on the way to total renewable energy use, while several countries have accelerated renewables with powerful tax incentives. (*47)

Such trends are emerging in New Zealand. Bioeconomic modeling, eco-valuing, the merging of economics and biology, are infiltrating more and more coursework at university level. The economics department at Otago University is a good example. With 600 million New Zealand nappies dumped in landfills each year, mothers are searching for "guilt free diapers." And one teenager in Christchurch has come up with a design that shreds and composts nappies to such an extent that a local newspaper hailed them "good enough to eat." (*48)

Since the Kyoto accord calls for countries like New Zealand to reduce greenhouse gasses by 5% from 1990 levels, the country best consummate its energy agenda, especially noting the fact ruminants are much at the heart of New Zealand's economic affluence. (*49) Julian Lee, chemist and director of nutrition and animal research for AgResearch, has stated that "Of all the countries in the world, New Zealand has the most interest in reducing methane." (*50) A big question concerns whether or not the EU's carbon credits market will accept credits from New Zealand's forest sinks. (*51) That uncertainty should not deter the NZ government from working to create a stock of such credits long in advance of the Kyoto Protocol judgment day, from 2008 onwards. Various new CO2 calculations include the EBEX21 Process, as it's called, a method for measuring, managing and mitigating CO2 emissions through forest regeneration which, in a single stroke will also help restore native biodiversity. (*52)

In the GE sector, from a conservation perspective, the jury is out whether or not New Zealand's firm public opposition to it will be sustainable in the end, especially given the relaxation of restrictions on genetic modification in the European Union this past April. (*53) But one particularly salient arena of concern, raised most poignantly by New Zealand's animal activism organization, S.A.F.E., is that of transgenic manipulations, and the GE experiments already occurring on farm animals within the country.

The Challenges of True Eco-Tourism

Tourism forces other hard questions into the open when seeking a biologically ethical pragmatism. With nearly 2 million tourists per year to NZ, a number that is growing, there has been considerable debate with respect to the so-called clean green untainted destination; the place where, as one American tourist told me dreamily, you can still see clean rain puddles. We hear many planners declaring that the key to eco-tourism is sustainability, namely, not exceeding carrying capacity. So does that mean, with specific reference to Milford Sound, that at 453,000 tourists in 2003 –up from 215,000 ten years before- it is time to build a 100 million dollar gondola "through pristine bush as an alternate route between Queenstown and Milford"? (*54) More and more, eco-tourism is simply a name for mass tourism. What constitutes a competitive New Zealand in the global marketplace for tourists is not just beauty but, increasingly, a *truly* clean green country. But that image had been challenged as early as 1965 by French zoologist Jean Dorst who wrote a book entitled **Before Nature Dies**, with a section named "The Devastation of New Zealand." That was a year after the revelations of rat infestations on Big South Cape. In 1997, the New Zealand Ministry for the Environment published its **State of New Zealand's Environment** which questioned the notion of a 'clean and green' country two years prior to the Green Party actually gaining sufficient numbers to

be represented in Parliament. (*55) In that year, Dr. Morgan Williams, Parliamentary Commissioner for the Environment, cited the tourism industry as largely unsustainable. Examples included continued promotion of hiking in Abel Tasman National Park despite existing congestion. (*56)

In looking at the economic drivers, the slick and elegant marketing approach to New Zealand tourism has targeted increasing numbers of visitors. A Middle Earth spin frenzy - all good wholesome fun- has garnered Tourism New Zealand various awards for its "100 per cent Pure New Zealand" campaign and for identifying the so called "ideal visitor." Now there's a conundrum. Who is it? The loin-clothed traveler arriving by benign rowboat or aboard a 747? Backpackers who visit with a CO2 mitigating tour company, carrying all of their litter out of the country, or the rambunctious sociopath determined to develop the next Queenstown?

Even the most well-intended eco-tourism can be destructive. (*57) Troubling data suggests high human visitations may be stressing wildlife, from polar bears in the Yukon, to bottle-nosed dolphins and Yellow eyed penguins in New Zealand. (*58)

At the Green Globe 21 Sustainable Tourism Conference in Kaikoura in March, 2004, Green Party MP Mike Ward called for a "$100 dollar conservation and heritage levy" on all tourists arriving in the country. That could nearly double DoC's budget –currently around $233 million each year- for starters. Since it opened its borders in 1974, Bhutan has charged $300 US dollars per person per day for the privilege of coming to the country. That includes all food, transport and lodging and maintains an international mystique that conveys to the traveler: This is a special domain and you get what you pay for. Kaikoura's Mayor Jim Abernethy declared that "with tourist numbers increasing we had to be responsible. Most visitors to Kaikoura are environmentalists; they've come to Kaikoura to see whales…they're concerned about nature." And Tourism Minister Mark Burton said that tourists have also been persuaded by this country's "100 per cent Pure" strategy and it is now up to New Zealand to deliver. (*59) New Zealand's Little Barrier Island suggests yet another aspect to eco-tourism: the place tourists can't get to know, but know is there. Such quiet repositories have an undoubted echo effect, harboring eco-benefits to the country, however unmeasurable. (*60)

Economic Responsibility

The balance between conservation biology and informed ecotourism are one side of the equation. Another concerns what consumers can do with their investments and this is where sustainability indeces take on especial power and scope as one enters the realm of the "triple bottom line" (*61) so as to encompass social and environmental performance in addition to financial. (*62) By the year 2000 new pension fund rules in the UK, and subsequently in Australia and elsewhere, required the funds to go public with their investing strategies with respect to social, environmental and other ethical factors. From the Morely Fund, and Calvert, to the Dow Jones, Domini Social, Broad Market Social Indeces, even PETA, socially responsible investments now account for over a trillion dollars (US) per year, 5% of the 20 trillion worth of consumer spending in the year 2000. (*63)

Not only are Fortune 500 multinationals responding to an increased market demand for sustainability, but churches, universities and other institutions are also exerting pressure on conventional utility companies to enlist additional sources of alternative energy. (*64) Most major oil conglomerates have expanded their portfolios out of an acknowledged necessity to encompass alternatives to their fast-dwindling fossil fuel supplies. (*65) Warming-concerned marketers began branding companies in the UK as early as 1997; and eco-labeling –whether under the Marine, or Foresty Stewarship Councils- have made increasing inroads into corporate conservation. (*66) Even the World Bank now seeks to manage forests according to high biodiversity standards. (*67)

In a 2002 Harris Interactive survey of the nearly 63 million adults who are part of a group known as Lifestyles of Health and Sustainability, "82% of these environmentally minded consumers say they would pay up to 20% more for healthy and sustainable products." (*68) According to ACNielsen research, 62% of New Zealanders would rather "choose a loaf of bread supporting, say, whale protection, over an identical loaf that stands for nothing….84 per cent think more highly of companies that support charities." (*69) All of this is good news for a country in which households annually spend more than they earn. (*70)

In New Zealand, the so-called "feel-good factor" has had to prevail upon public sentiments of charitable giving, where the average amount donated annually by individuals varies between $50-and-$73 dollars, or from 200 to 290 million dollars per year nationwide, excluding corporate giving, all in absence of tax write-offs. (*71) By comparison, with 70 times the population, 2002 saw over 241 *billion* dollars donated to U.S. charities, "90% by individuals," in a country with high inheritance and capital gains taxes. (*72)

There are, however, other mechanisms for generating environmental benefits in New Zealand than merely a reliance on the good will. Tax shifting, for example. Among the 30 OECD members (Organisation for Economic Co-operation and Development), "broad-based tax restructuring" to reverse environmental assaults was recommended three years ago. (*73) How to properly account for, and distribute ecological liabilities and rewards will continue to challenge policy makers, but at least the stakes are clearer at local levels. (*74) Even if a community's many imperatives are difficult to prioritize. (*75) Tax incentives favoring more conservation land or more farms? for example.

Ground Zero Issues

Farming is synonymous with New Zealand's economic heartland; habits of mind and culture which impact directly upon the biological bottom-line. These traditional economic drivers -animal-based industries and agriculture- account for more than 50% of the country's terrestrial hegemony. (*76) Little wonder, then, for starters, that New Zealand should have the second highest levels of annual fertilizer application per hectare in the world (after Iceland), or 1,062 kilograms. (*77)

Though rated #20 among the 30 OECD nations, its wealth remains inordinately dependent on "farm-based commodities," 20% of New Zealand's overall per capita wealth, versus 5% in the U.S., and 2% in Europe. (*78) At the same time, fears have already surfaced that there is a growing shortage of farm workers; that fewer and fewer young people will be interested in becoming shearers and shed-hands and that schools better start promoting farming as a career move or the country will be in trouble. (*79) But what kind of trouble? The same situation has emerged in France where –between 1980 and 2000- the number of French farmers dropped by half, as an aging rural sector, migration to cities, and reduced subsidies under the Common Agricultural Policy have greatly reduced farm incomes, and left but 3% of the country's workforce engaged on the land. (*80)

In New Zealand, 85% of farmland is stocked with animals: 54,640,000 million sheep, cattle and pigs, 77 million broiler chickens and hens, et cetera. (*81) Animals whose excreta have created the equivalent toxic burden of a human population of some 160 million people, or nearly three Great Britains. Little wonder that New Zealanders suffer among the highest rates of water-born protozoan parasites in the world. (*82) Many of the country's 300 or so landfills –containing 3.4 million tonnes of waste each year- have no liners. Moreover, there are 500 billion litres of sewage and a million tonnes of sludge generated annually. (*83)

Then add to this the escalating presence of predators and various exotics and the clean green profile disintegrates even more so. The number of introduced species is not known precisely, but there are at least 38 land mammals –including over 50 million possums and who knows how many rats and mice, 20 freshwater fish, 2,000 invertebrates and nearly 25,000 species of fungi and plant, including 2,000 vascular plants. All can be said to be relative newcomers. (*84)

However one might view invasives, naturalized or not, the annual costs incurred by introduced pest species to New Zealand are estimated at $840 million while posing the most serious of all threats to pre-existing New Zealand biodiversity. (*85) Because of the scope of this biosecurity crisis assailing New Zealand, every possible remedy should be investigated, and that includes fertility intervention methods for non-native predators, which could constitute the most humane environmental practice, and might well be the only effective solution in the end. (*86)

Adding to New Zealand's terrestrial hotspot considerations are those of its marine environment, including the sounds, a longtime concern among conservationists in this country. New Zealand's Exclusive Economic Zone constitutes nearly 1 billion hectares, the fourth largest in the world. Will the nation nurture it with all the vigor and knowledge at its disposal? Whereas some 30% of terrestrial New Zealand is protected, only 7% of the country's waters enjoy similar safeguards, with 18 marine reserves having been vouchsafed, and ten others now in application process. (*87)

On New Zealand's mainland areas there are something like 240 different so-called "ecosystem domains" but only 10 on the nearly 700 offshore islands. (*88) Hence, the future of conservation endeavors in New Zealand must somehow engender mainland core areas of enduring restoration, preserving evolution itself, whilst continuing to cope with predators on offshore islands where nurseries for species may be perpetuated. Mainland predator control remains controversial, despite years of hard practice. DoC recently applied for a ten-year regime of aerial drops of 1080-laced cereal pellets over Fiordland National Park, specifically to reduce possum numbers. Of the 42 public submissions in response, only one was in favor, while 39 opposed it. (*89) In a 2001 report from the Parliamentary Commissioner for the Environment the cost-effectiveness of aerial bates in remote areas was described as "not advisable in the long-term," (*90) lending additional weight, by interpolation, to the logic of immunocontraception.

These biological conundrums must weigh heavily on planners. In some Central Otago habitats (*91) there have been known to be as many as 280 species of invertebrates dependent on just two species of plant –a ratio equivalent, in some instances, to symbioses in the Amazon. How, then, to mix exotic species invasions, over-sowing, irrigation, rabbits, tourism, livestock, and top dressing, with biodiversity conservation? In an Environment Court hearing with reference to the Central Otago District Council's district plans, the Royal Forest and Bird Protection Society was asking for a suitable integration that acknowledged such fragility and limited development in areas of significant indigenous vegetation. If *you* were the Principal Environment Court Judge in that case, how would you determine what's fair, what's practical, and what best preserves the indigenous biodiversity? (*92)

Similarly, in a report detailing sensitive ecological areas throughout the Auckland isthmus that could be threatened by a proposed eastern highway, city planners were confronted by a list of 142 sensitive natural habitats and key ecological sites. How can the so called "greening the city programme," and the requirements under section 10 of the RMA (mandating the "maintenance of indigenous biodiversity") be reconciled with a spanking new highway guaranteed to cut down upon those increasingly Bangkok-like traffic jams, but that might well encroach, or destroy certain high value areas, such as "young indigenous forest"? (*93)

And how should planners react to future proposals likely to seek exemptions from carbon fees under Kyoto Protocol, such as refineries or power plants? (*94)

Environment Southland's **Water: State of the environment report**, released in October 2000 describes a "pressure-state-response framework" for evaluating a variety of drivers exerting environmental change. But the document also acknowledges that many indicators, like personal behavior, "are not easily quantified" (*95) A human population in Southland of 94,100 as of June 1999 (*96) means 94,100 separate behaviors. (*97) "In 1999 there were 4,791 farms in Southland covering a total of 12,350 km2" or "82 percent of the total area of non-conservation land." (*98) There are countless sets of data, of complex syncretisms and interrelationships which elude capture. Southland livestock –

nearly 8 million animals. The personal spending habits of farmers. The microbial contamination of waterways. Suspended solids. Faecal coliforms. Elevated nitrate levels, disappearing macroinvertebrate communities, the build-up in streams of phosphorus and nitrogen. BOD. Superphosphate, urea, animal effluent, 760 million pounds of fertilizer, and additional pesticides applied annually. Over 400,000 animal corpses dumped in offal pits each year, the ones not slaughtered for food or other byproducts.

Twenty-three of the country's twenty-nine remaining native fish inhabit Southland's waters. The grayling went extinct in the 1930s. "Succumbed to agricultural pressures" – that's the way its demise was described. (*99) Probably a few people alive today, who then were children, might recall the face of a grayling staring back at them; an individual grayling; a fish that –by some scientific indicators- had consciousness, was aware of its own identity, its being in the world. Four living indigenous fresh water fish are threatened in Southland, one of which –the shortjawed kokopu (*100) is verging on extinction. Tourism in the Southland is increasing by 7 per cent a year with all of its associated impacts, positive and negative. What are the indicators that describe the total tapestry – not of impact, per se (as in the measurement of the ubiquity of pathogens), but of trade-offs? (*101) What is truly sustainable, ethical, and what is not?

New Zealand farmers have collectively put some 140,000 acres of private land into ecological convenants (the size of a single large Kansas ranch). (*102) But beyond these acts of altruism, and generosity, the RMA, according to some critics, has been least effective in the rural sector. Dairies, piggeries, and other non-point pollution sources have been elusive under the RMA, whose consent process itself seemed to be an expensive encumbrance, according to an American Chamber of Commerce survey in the late 1990s which deemed seemingly built-in delays to be the reason more American companies were not doing business in New Zealand, even though New Zealand is considered to be the most user-friendly country in the world for foreign corporations. (*103) By turns, the RMA, according to David Young, incorporated the "economic rationalism" of Geoffrey Palmer, and the "environmental heart" of Simon Upton. The end result, says Young, is a "legislative arabesque" (*104) and it must be interpreted between all the different regional, district and city councils nationwide. That sounds vitally democratic, but some have criticized what was perceived to be the "non-performance of councils in controlling the adverse environmental effects of rural land use." (*105) Writes researcher Julie Frieder, "Many New Zealand businesses appear to be caught in a reactionary mode of fighting for deregulation and privacy rather than being active partners in shaping smart environmental policies and management to secure New Zealand's clean and green championship in a competitive world economy." (*106) Frieder coined that critique seven years ago. Has New Zealand's business ethos since changed? Companies like Comalco –noted for its loyal and strong assistance to the Kakapo Recovery Programme, have joined the Resource Management Business Forum. Others have developed higher qualitative standards according to the Forest Stewardship Council. Yet, David Young himself writes, "`Clean and green' New Zealand may fill our tourist hotels to capacity, but as a couplet for improving citizens' attitudes to the environment it is often a mantra that simply reinforces our natural complacency." And, referring to real sustainability, he says that it "is not yet on the horizon." (*107)

Geographer Mairi Jay disagrees, writing, "There has been a surge of public concern for conservation of native plants, animals and landscapes. But this time the concern expresses itself through the action of private individuals, local communities, and non-governmental organisations." (*108) And she describes a veritable renaissance in restoration throughout this country. One is reminded of the late Jack Haapu whose work led to the formation of New Zealand's sixteenth marine reserve off the East Coast of the North Island. As described in *Forest & Bird* (*109), "his wish was to see his tribe's traditional food-gathering area protected 'as a nursery and a sanctuary for the benefit of future generations.'" A compelling formula. But, asked Mairi Jay at last year's Planning Institute Conference, "Can planners join the new wave of biodiversity restoration? Or are they too afraid to work with developers towards a vision of future landscapes that will retain what still remains, restore what has been lost, and create hybrid new landscapes where native and exotic operate sustainably together?" (*110)

The Animal Welfare Underpinnings of Sustainable Farming

I began by reference to the integration of conscience and sustainability. In conclusion, I should like to consider the most troubling of all such partnerships under this latter aegis of sustainable togetherness. I refer to farm animals themselves, each one of whom, according to American philosopher Tom Regan, has a "biography, not merely a biology." That much heralded 100% pure green promise poses a lurking mismatch between international perception and the reality of animal welfare in this country. A brief overview should suffice to suggest the problems at hand. (*111)

The whole collective of animals in New Zealand raised for intensive milk and meat production, and others who will eventually be slaughtered, comprises a population exceeding 131 million animals, or nearly 32 animals for every resident human. (*112) The deliberations which brought the ***Animal Welfare Act*** (***AWA***) to fruition January 1st, 2000, were surely accelerated, according to Law Professor Peter Sankoff, as a result of immanent economic pressure from European legislators who themselves had been forced by the EC to adopt numerous animal welfare reforms and recognized that such changes seemed to be lacking to various degrees in this country. (*113) The resulting ***AWA*** was laudable, as its provisions required farmers "at all times to provide proper food and water, adequate shelter, protection from and treatment of injury and disease, proper handling, and an opportunity to display normal patterns of behaviour." (*114) All well and good. Except that supplemental legislation in the form of various "codes of welfare" have not yet been ratified, or tested, leaving that population of 131 million mammals with very few actual protections. In fact, out of the original 22 voluntary codes from 1999 when the ***AWA*** was passed, six of the codes were held back for refinement. And the other 16 are at minimum standard, as "voluntary guidelines with no legal standing." (*115) And hence, writes Sankoff, "There is good reason to believe that these existing standards do not accord with emerging international practice." (*116) For example, unlike New Zealand, 69 countries have banned the leghold trap, and 19 countries across Africa have banned all traps. (*117)

The overriding issue for all farm animals must hinge upon the question: What can be done to unambiguously improve their welfare and happiness? More and more people are taking note. (*118)

The continued use of sow stalls is one such sore point for the country, pitting pork producers against many consumers and the RNZSPCA. The decision by at least 71% of producers to continue to use the crate system until 2012 and then allow continued use for the first four weeks of a pig's pregnancy after that time is, according to SPCA President Peter Mason, "a national disgrace." (*119) Swedish farmers raise pregnant sows in groups, where their natural behavior can, at least, better be expressed, in far more humane surroundings of deep hay. Why not in New Zealand? (*120) Sankoff also examines mandated standards with respect to stocking densities for chickens in Europe "of approximately 12 birds per square meter, with a lower level being advisable." (*121) But the lower, more humane levels were dismissed as "inapplicable" in New Zealand, according to Sankoff, who says that "an absence of New Zealand research" was cited (*122) with the result that in this country stocking densities allow for some "20 birds to be housed in an area about the size of a phone booth," notwithstanding a long list of resulting pathologies from "breast blisters, chronic dermatitis and leg disorders" in chickens. (*123)

Countless other problems enshroud animal welfare in New Zealand, from lack of funding and legal aid available for those few investigators nation-wide, a mere nine people, to the whole setting of sentencing for animal abusers. While the ***AWA*** has increased fines and jail time (*124) for "willful ill treatment leading to death or permanent disability of an animal" (*125) Sankoff writes, "Week after week, judges from across the country have imposed sentences on animal abusers that would be laughable if they were not so tragic." And we're speaking not just of farm animals here, but also of so called companion animals, an odd distinction that has, to date, somehow managed to skirt a looming ethical divide throughout the world. (*126) Two recent examples by Sankoff here in New Zealand should suffice to convey the point: "Fine of $250: To the owner of a pig who was caught after having bashed the animal repeatedly over the head with an axe. The pig was discovered alive, covered in blood, with holes in its head and neck." (*127) Or this one: "150 Hours Community Service/ Fine of $45: To the owner of a golden retriever who left the dog in a small box standing in its own faeces. The dog's right hind leg was partly missing, with only a bloody stump remaining. The dog was euthanized." (*128)

In addition to outright cruelty, there is also neglect. With farmers chasing a 4% increase in productivity over the next decade, the pattern of underfeeding, or the so-called "skinny cow syndrome" has arisen along with the outgrowth of high stocking numbers. "We need a massive change in farmer attitude," says research scientist Dr. Clive Dalton. (*129) In one incident, a person in Hamilton let six calves suffer because, according to the owner, they were not suckling on cows and were no good to him. The calves were put out of their misery. The farmer fined a trifling $500, and no prison sentence. The industrial rage for animal by-products could well turn New Zealand into a mere EPZ or export processing zone, creating "inexpensive goods for global consumers." But remember: the existing 3,000 EPZs in 116 nations are the very ones that have fostered the majority of

human rights abuses. (*130) What about animal rights abuses? This is precisely where consumers, investors and money managers are beginning to exert the power of their conscience. Worldwide, in the name of animal welfare and sustainability, a sea change is underway.

But in New Zealand it may not be coming fast enough. Thus far, despite some 150 criminal convictions, according to Sankoff, there has not been a single imprisonment under the ***Animal Welfare Act*** of 1999. (*131) One judge in a recent case brought by the SPCA declared, "We are dealing here with animals, not with people, not with children, not with women…" (*132) So one must ask: We marvel at the beauty of a kakapo, but take scant notice of a pig, or turkey, a cow or sheep. Why is that?

"Overseas customers are increasingly seeking a change, demanding farmers improve animal welfare," writes grasslands scientist Dr. Deric Charlton (*133). Moreover, consumers are willing to pay more out of their own pockets for humane improvements. Surveys across Europe and the U.S. have shown this to be so. (*134)

In 2001 the Ministry for the Environment commissioned a report that sought to place a value on New Zealand's clean green image in the international marketplace. "The image is worth at least hundreds of millions, possibly billions, of dollars – aggregating value elements from dairy, tourism and organic produce and extrapolating to other sectors such as meat." Moreover, the report suggested that "New Zealand is relatively clean and green. This is mainly attributable to our low population density resulting in relatively benign environmental pressures." Vigilant attention to maintaining that environmental image in marketing strategies was called for. Most instructively, the report cited the country's vulnerability, and summarized the findings of a 2001 Ministry for the Environment report which conceded that "It is the environmental image that creates the value not environmental quality per se." (*135)

That admission may be shocking to some. In the meantime, while the country struggles to merge value with quality, the condition of many of the animals themselves at the very least, raises serious questions. "The domesticated animals who live on our farms are very little removed from their wild ancestors and therefore have all the emotions that belong to those wild animals," says philosopher Jeffrey Masson, (*136) in a moving testament to the moral status all such creatures should be granted by their human companions.

Clearly, New Zealand farm animals, on balance, have vastly more enriched habitat and green space than most of their counterparts in the largest meat-producing nations. Worldwide, some 50 billion animals a year are slaughtered under ghastly circumstances by humans. (*137) Yet, wide ranging scientific and anecdotal data suggests that it would be the height of arrogance to limit the realm of attributed sensitivity, emotional vulnerability, beauty and intelligence merely to our children and to one another. To site but one recent example, a companion African grey parrot in New York City named N'kisi now wields a considerable vocabulary of 950 words and articulates with uncanny originality. One British poll suggested he should consider running for the U.S. presidency. (*138)

Conclusion

To conclude, so many of the settlers to this country must have come with great dreams that were further excited by the sheer magnificence of this land. That clean air and sense of freedom elicited in our own souls. But looking back at, say, 19th century painter John Gully's romantic heavens and dales, or Mesopotamian sheep farmer Samuel Butler, imagining his Erewhon –his dreamt of utopia beyond the ranges, one must now confront the truth, which is a mixed bag. Are those former dreams to be reconciled with an equally dreamy future? Is it possible? Perhaps that is no longer the question. Perhaps the real question is: Knowing what we now know and feel, what is perfect is no longer an option. But what is good, and lasting, may indeed be the only plausible, sustainable scenario to work out. We have no other choice. (*139)

Footnotes

*1 – A modified version of this introduction was first delivered to the New Zealand National Planning Institute in Invercargill, May 2004 by the author.

*2- With just 5% of the world's population, the U.S. as a country still manages to divert well over 20% of the world's resources, each American consuming, for starters, 300 pounds of steel and releasing 28 pounds of toxic chemicals into the environment each year. For consumption data, see Lester Brown's exquisite **Eco-Economy –Building an Economy for the Earth**, Earth Policy Institute, W.W.Norton & Company, New York, 2001, p.132. As for Some, like the late Ashley Montague insisted we are, essentially, non-violent, low-impact consumers and certainly if one considers, for example, the Bhutanese Drukpa, the Tanzanian Hadza, the Bishnoi of Rajasthan, the 60-odd Tasaday of Mindinao, the Karen of eastern Thailand and Myanmar, the 1200 or so Toda of Tamil Nadu, and the Amish and Jains, there is no doubting that these assorted communities represent some of the notable blueprints in the world of ecological virtue. Among the 15 million or so Jains, for example, non-violence, ecological orientations and professions and the very notion of global interdependency amongst all living beings at the heart of their beliefs and daily life have proved to be exquisitely pragmatic, actually making them one of the most prosperous and philanthropic of all ethnic groups within modern-day India. They have even created high-rise condo complexes –for vegetarians only. But other paleontologists and historians have focused on communities steeped in a Hobbesian nature, blood red in tooth and claw, supported by data like the 90 or so different prey species whose bones found in the Choukoutien caves south of Bejing show an unambiguous carnivore that was Homo erectus. Or the first cave paintings from Namibia's Mesolithic era, just 5,000 years ago, depicting a battle abetted by spears, a precursor for all future warfare which, by some estimates, has resulted, just since the time

of the Renaissance, in over 250 million victims. One war historian has reckoned that for most of human history roughly half the population has been engaged in non-violent activities, the other half in violent ones. See **Life Force –The World of Jainism**, by Michael Tobias, Asian Humanities Press, Berkeley, CA, 1991; and **After Eden – History, Ecology & Conscience**, by Michael Tobias, Slawson Communications, San Diego, CA, 1984.

*3 – Of that amount, $969 per hectare per year derived from forest cover. The group included Robert Costanza and a dozen other scientists. See Brown, ibid., page 174, cited from *Nature*, May, 1997. For thorough discussion, see Chapter Three, "New York: How to Put a Watershed to Work," in **The New Economy of Nature – The Quest to Make Conservation Profitable**, by Gretchen C. Daily and Katherine Ellison, a Shearwater Book, Island Press, Washington D.C., 2002. See Robert Costanza, Charles Perrings and Cutler Cleveland, **The Development of Ecological Economics**, Elgar Press, Cheltenham, UK, 1997. See also: New York City Department of Environmental Protection: www.ci.nyc.ny.us/html/dep.

*4 - Dr. Tim Flannery declares that conservation strategies in New Zealand are in such a state of emergency they must take precedence over the luxury of longer-term strategic planning. Others would argue that, notwithstanding emergencies, without long-term planning, there may not be a future. See Tim Flannery, **The Future Eaters – An Ecological History of the Australasian Lands and People**, Reed New Holland, Australia, 1994, p.387.

*5 – Sir Tickell is Chancellor of the University of Kent at Canterbury, and Convenor of the Government Panel on Sustainable Development (1994-2000). See Michael Tobias, ed., et.al., **A Parliament of Science – Science for the 21st Century**, State University of New York Press, 2003.

*6- Consider people like Don Merton of DoC, a long-time champion of conservation biology in this country and throughout the world, or Janice Malloy whose Southern Seabird Solutions has managed against all odds to form a critical partnership between scientists, fishermen, government agencies, tour operators, corporations and the likes to find a way to protect hundreds-of-thousands of seabirds –such as the albatross- from the potentially lethal fishing longline baits that drag the birds to their deaths. There are countless other examples. See "Saving Seabirds," by Elizabeth Light, *North & South*, March 2004, pp.82-89.

*7- Meanwhile the 100% pure clean green image of this country is attempting to piggy-back upon the nation's exploitation of such natural capital. Is there a looming contradiction? Birks & Chatterjee, eds., **The New Zealand Economy: Issues and Policies**, 4th ed., (2001), p.233, cited in Peter Sankoff, "Five Years of the "New" Animal Welfare Regime: Lessons Learned From The New Zealand Experience with Farm Animals and Animal Welfare Legislation," March 2004.

*8 – "In the last 100 years, New Zealand's energy use doubled every 22 years," writes policy analyst Tania Hood with the NEECS –National Energy Efficiency and Conservation Authority, in her address, "Changing the way we think about energy - the role of planners in achieving a sustainable energy future?" delivered at the May 2003 New Zealand National Planning Institute conference, Hamilton, p.1. In addition, New Zealanders produce a high rate of 2,258 kilograms of carbon per person per year.

*9- New Zealand is considered a *hotspot*, a term which loomed in the late 1980s with such prominence that the MacArthur Foundation adopted it as the basis for its biodiversity investments throughout the world. The concept has been spearheaded for more than a decade by Conservation International in Washington. Today, there are 34 terrestrial hotspots –Japan being one of the most recent additions- and probably many more in the oceans. These terrestrial locales comprise approximately 1.7 percent of the earth's total land surface, account for more than 60, possibly even 70% of the planet's biodiversity, referring to all endemic plant and non-fish vertebrate species. See **Hotspots, Earth's Biologically Richest And most Endangered Terrestrial Ecoregions**, by Russell A. Mittermeier, Norman Myers, and Cristina Goettsch Mittermeier, coordinated by Patricio Robles Gil, Publised by Cemex, Mexico, 1999, p.37 and personal conversations with R.Mittermeier. See also, Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A.B. & Kent, J. Biodiversity hotspots for conservation priorities 403, 2000, p.853. In biological hotspots, the speed of extinction is even greater, and the richness and representative biodiversity of the regions in question, ever more extreme. As of the year 2000, a known 11,167 species worldwide were threatened with extinction. See "Leveraging Science for Conservation," Center For Applied Biodiversity Science at Conservation International, June, 2003, p.2. Today, just four years later, that number has increased to over 12,000, or, 2.5% increase per year. See Joshua Reichert, Director of Environmental Division, Pew Charitable Trusts, *Los Angeles Times,* "One by One, the World Is Becoming a Lonelier Place," March 15th. Hotspots have come to be defined according to whether they meet certain criteria, a high percentage of vascular plants, 25% or less of native vegetation remaining in tact. "Vertebrate endemism and diversity" and the "degree of threat" are the other criteria now continually assessed by such organizations as Conservation International. op.cit., **Hotspots**, ibid., p.30.

*10 - Not surprisingly, as an island nation, New Zealand's declining indigenous species comports with what has come to be viewed as a global crisis, particularly for birds. Data from a recent Worldwatch Institute publication suggests that "93 percent of bird extinctions recorded since 1500 have occurred on islands." See **Winged Messengers: The Decline of Birds**, by Howard Youth. Cited in J.R.Pegg, "Bird Populations Plummet Under Weight of Humanity," Environment News Service, 2003, p.1. See also, "Sparrows and starlings go on endangered list," by Anthony Browne, *The Financial Times*, August 16, 2002, p.11. Moreover, says Youth, "The actions needed to ensure a secure future for birds (which he treats as environmental indicator species) are the very same ones needed to achieve a sustainable human future." Notwithstanding, or because of, her diminutive size, New Zealand, ranks number 13 among the other hotspots in terms of endemic birds at risk, and number 12 when it comes to reptiles. When New Zealand's endemic birds are then looked in relation to their original, unmodified habitat, this country ranks 10 among the other hotspots, just after Western Ecuador, Madagascar and various Indian Ocean islands, the tropical Andes, the Caribbean, Philippines, Wallacea –the central islands of Indonesia, including Sulawesi and the Moluccas, the Eastern Arc Mountains of Kenya and Tanzania, New Caledonia and Polynesia/Micronesia. See **Hotspots**, p.46. Currently, 11.5% of the terrestrial planet is protected, according to scientists at the Fall/2003 World Parks Congress in Durban, South Africa. However, some of that protected area, according to researchers with the Center for Applied Biodiversity Science at Conservation International, are not the ones with the highest megadiversity. Moreover,

"at least 300 critically endangered species of animals exist in unprotected areas." See "Hundreds of Animal Species Nearly Extinct, Study Warns," by Julie Cart, *Los Angeles Times*, April 8, 2004, p.A25.

*11- Additional information from conversation with Don Merton, and Don Merton's two lectures at the Dancing Star Foundation "*Island Fest 4*," March 5th and 7th, at Stewart Island Community Centre, and Invercargill Southland Museum, 2004. According to the IUCN Red Book criteria, very different numbers emerge: 269 animals and 56 plants, number two, which include 20 known previous extinctions of taxa. IUUCN Red Book for 2003, lists 6a and 6b. The reason for this discrepancy is a very different set of criteria used in the "endangered" characterization. Difficulties in assessing the viability of species has been debated within biological circles for some time –whether a viable population is 4000, or 250, or some number in-between, depending on the species, the habitat, whether endemic, or a host of other issues. Similarly, the appropriate rules-of-thumb for designating "true wilderness," or "pristine habitat," have seen continuing discussion. Some argue that true wilderness requires 4,000 square kilometers of undefiled terrain. Others use a working definition that is greatly truncated. Differences of opinion regarding the sheer number of species on earth have also varied by as much as a power of ten.

*12- By original, one refers to prior to the presence of human beings. Ecological historians may well debate to what extent and for what reasons the Maori burned off forest, perhaps a third of all New Zealand forests over the course of some 250 years, to make way for long-lasting kumera gardens, high in carbohydrates, or create larger areas for cultivating the root of the bracken fern. See Richard Tong and Geoffrey Cox, **Clean and Green? The New Zealand Environment**, David Bateman Ltd., Auckland, 2000, p.31. During European settlement in just the last decade of the 19th century. Timber production took out 3.5 million native hectares, or 27% of the entire forest estate of New Zealand in less than 15 years. Nothing like that has ever happened so rapidly. New Zealand's parliament was encouraging such destruction up until 1919, when almost all forest on so called usable land was gone. New Zealand's subsequent adoption of the fast growing exotic, *Pinus radiata* from Southern California, is only another biologically devastating chapter in the history of New Zealand's forestry practices, adding something like 70,000 hectare of cloned, monoculture every year to the country's landscape,

*13- In discussing IPAT, the Parliamentary Commissioner has stated that "If there is to be sustainable development, the scale of human enterprise must ultimately be limited. The scale of that limitation can be thought of in terms of an equation whereby the Impact of humanity on its life support systems is the product of Population size multiplied by per capita Affluence (consumption) and some measure of the impact of Technologies (and input combinations) employed to supply each unit of consumption." See "The Population Conference – People, Communities, Growth," Te Papa Tongarewa, March 12-14,1997. www.executive.govt.nz/96-99/minister/bradford/population/content/pnldis2d/pnld2d_4.htm

Is human nature given to the flexibility that would be necessary for people of differing persuasions, motives and beliefs to actually listen to one another and exercise subtle changes in their philosophies, methodologies, and ethics so that sustainable non-violence might, in the end, prevail for more individuals and species than it does at present? I can't answer that. But I certainly can *ask* whether any democracy in the world today up to the

task of such collective lateral thinking? Because, ultimately, true sustainability will require it.

*14- The precise number of newborns in Southern California was 93,168 for LA and Orange Counties between July 2002 and July 2003. See "Southland's Population Still on the Rise," by Caitlin Liu, *Los Angeles Times*, February 14, 2004, p. B6. Southern California as a whole grew by 1 million residents between 2000 and 2003, the majority of whom were born there, rather than migrating there. See "Southland's Census Story, in a word: Boom!" by Scott Martelle and Janet Wilson, *Los Angeles Times*, April 9, 2004, pp.A1 and A20.

*15- Most of those 1.6 billion Indians will languish beneath the poverty line of $2 dollars per day per family. Neighboring Pakistan will reach 500 million people by that time. Demographics matter. Indeed, if current global fertility trends were to continue –which I don't believe they will- the human species would hit 13 billion. Barring unforeseen plague or nuclear armageddon, the human population will reach between 9 and 11 billion, however. And even now, nearly 100 wars and armed conflicts are occurring in the very regions of high fertility. See "No Vacancy," a feature documentary by Michael Tobias, Dancing Star Foundation/Population Communication, 2004, Produced by Bob Gillespie, Elizabeth Hughes, and Jane Morrison. See also: **The Security Demographic – Population And Civil Conflict After The Cold War**, by Richard P. Cincotta, Robert Engelman and Daniele Anastasion, Population Action International, Washington D.C., 2003, p.21.

*16- Globally speaking, human consumption of fresh water has made for a worldwide net water deficit of 160-billion tons, or half the equivalent U.S. grain harvest each year. op.cit., Brown, **Eco-Economy**, p.45. Severe soil erosion now covers 36% of previously productive global cropland - Brown, ibid., pp. 50-51; all of the world's 17 primary fisheries are "being harvested at or beyond their sustainable capacity," according to Lester Brown and more than half are in decline. Over 27 % of all coral reefs are now severely damaged (Brown, ibid., p.53); twenty-five percent of the world's known 640 or so primates are threatened with extinction; 24% of all of the 4763 mammals, 30% of the 25,000 fish species and 12 percent of the more than 11,000 bird species are threatened and a staggering 70% of avians are declining, with 1183 in "imminent danger of extinction." See **State of the World**, op.cit, p.16. Even 10 of the world's 17 penguin species are endangered. Mammals, birds, reptiles, amphibians, fishes, insects, molluscs, crustaceans, mosses, ferns, gymnosperms, and so forth. Only the global status of lichens, to date, suggests any relaxation from the sixth extinction spasm in biological history, unleashed almost exclusively by human behavior. The house of cards upon whose frail edifice we now impinge like few known catastrophes in the annals of life, is collapsing over the course of but a few human generations. The recent study by the Queensland University's Centre for Marine Studies has predicted that global warming will destroy most of the Great Barrier reef within 45 years, and a total collapse –at worst, by 2100, with re-establishment unlikely even within 500 years. How that will affect Australia's burgeoning eco-tourist industry one can only imagine. But it is an example of how ecological footprints –in the case of global warming- are everybody's problem. When Newfoundlaned's cod fishery was forced to shut down because of unsustainable catch levels in 1992, 40,000 people were thrown out of work. See Brown, ibid., pp.69-70. According to the most recent Population Reference Bureau statistic, our species numbers

6.314 billion and is growing by 1.3% per year, or 82 million. Biological success is normally noted by robust numbers. But in the case of Homo sapiens, our triumph must emerge in those tendencies which inhibit, rather than exploit; which safeguard and cherish, treading lightly and modestly to conserve remaining pristine habitat, rather than consuming, bulldozing and flexing a muscleman mentality.

*17- And that's where New Zealand presents an especially interesting question mark, particularly in the realm of conservation; embarking on some of the most idealistic biological initiatives in the world today. Forty-three species translocations to various largely predator-free sanctuaries within the country, most on islands, but several dozen on the mainland. What other nation today would lend so much fanfare and significance to insects, the translocation of weta, for example? This is one reason why New Zealand has got it right, from the heavily-managed kakapo recovery programmes to the life-saving efforts on behalf of dozens of other species, from *Euphorbia glaucus*, and Harlequin geckos to Short-tailed bats and Campbell Island teal. See *Department of Conservation Fact Sheet*, July 1999, "Giant Weta," No.10.

*18- Brown, in **Eco-Economy**, p.240, cites the figure of more than $700 billion per year, as reported by the 1997 Earth Council study, "Subsidizing Unsustainable Development" by Andre de Moor and Peter Calamai, San Jose, Costa Rica: Earth Council. The 1 trillion dollar figure can be found in **State of the World 2004**, The Worldwatch Institute, Erik Assadourian, Christopher Flavin, Hilary French, Gary Gardner, et.al., W.W.Norton and Company, New York, 2004, p.15.

*19- Like India, China also has little room left, certainly in terms of arable land and with her cash reserve flows, she could easily outstrip already diminishing grain supplies otherwise needed for hundreds of millions of people who are hungry elsewhere. The country has finally stopped cutting down her forests –having lost most domestic watersheds, but now seeks resources outside the country. Her enormous foreign reserves (estimated at approximately $403 billion US) and global spending spree is spawning an orgy of mergers and acquisitions, a new consumer imperative on the world stage that greatly complicates the puzzle for everyone. See "Going Global," by George Wehrfritz, *Newsweek*, March 1, 2004, p.28.

*20- As Bixby Professor Malcolm Potts of the University of California at Berkeley has put it, "I think it's more important to be able to control your fertility than it is to go to the ballot box or to have a free press." The point is, one can have it all, and does so in more and more countries. In fact, on a brighter note, more and more women are restricting their family size to two children. In country after country, the demographic winter, so called, is subsiding. In other words, the classic demographic transition is occurring. Mexican mothers who grew up in families of 11, are themselves having no more than 3. Throughout Indonesia, roadside stalls are likely to have numerous over-the-counter contraceptives for sale. In Nigeria, a few brothels are now awarded medals of honor if they effectively promote safe sex. From Thailand to Iran, fertility rates have declined from over 6 children per couple to under two, in as few as a dozen years.
See "No Vacancy," Feature Documentary by Michael Tobias, A Dancing Star Foundation/Population Communication Production, 2004.

*21- See data in *Population Coalition*, Pasadena, CA, December 2003.

*22- What affects one species must affect all others. New Zealand's population density of roughly 14.9 per square kilometer is 30 times less than that of Holland and 17 times less

than the rest of Europe, on average. Yet, the ecological impact within is striking. And like Holland, and the so called "Netherlands Fallacy" about which it refers, New Zealand remains dependent on imports. It could not easily sustain its own 4 million people in a vacuum. Few countries could. Collectively, the 6.3 billion people on the planet require an ecological enclosure per person the size, on average of 2.3 hectares, yet there are no more than 1.9 hectares per person with sufficient biological productivity to supply the needs of our species, notwithstanding the fact that nearly a third of humanity survives below the poverty line.

Even with 14.9 per square kilometer, ranging over a country the size of 268,680 sq. kilometers, New Zealand's footprint is felt not merely at home, but around the world though this is not easily gauged. For example, in metric tons of CO2 emissions, the country produces less than, say, Ireland or Norway or the Netherlands and considerably less (7.9 versus over 19 metric tons per capita as of 1998) than the U.S., according to Population Reference Sheet data. See "New Zealand's Ecological Footprint," Ministry of the Environment: < www.mfe.govt.nz/publications/ser/eco- footprint-sep03/html/page6.html> See also, **Our Ecological Footprint: Reducing Human Impact on the Earth**, by Mathis Wackernagel and William Rees, New Society Publishers, Gabriola Island, B.C., Canada, 1996.

*23- Ireland has about the same population number as New Zealand, though roughly a fourth the land size. Her density per square miles is 147. Her per capita income 30% higher than New Zealand's, her projected population for 2050 a mere 4.7 million. Yet, the condition of Ireland's wildlife and forest habitat is not good, with 100 endangered animal species, and 3 endangered plants. The French Southern Territories with almost no human population show 37 endangered species. South Georgia and the South Sandwich Islands, 24; the Maldives, 47; Cyprus, 61; Israel, 174; Qatar –32; Oman –136; Andorra –25; Greece –243; even laudable Denmark –133 and Austria, 233; Portugal –295; the Netherlands –164; Switzerland –179; Trinidad and Tobago –143; the Falklands –41; the Solomon Islands –138; Pitcairn –30; Samoa –47; New Caledonia –103. These are all **2003 IUCN Red Book** numbers, whose criteria are far less stringent than those of the Department of Conservation in New Zealand.

*24- This is due to the approximately 200 toxic compounds that migrate from European nations in zooplankton and marine animals like Narwhal toothed whales and ringed seals then fed upon by Inuit. Some 95% of women in East Greenland show levels of more than 5 parts per billion of the PCBs in their blood. See "Ancestral Diet Gone Toxic," by Marla Cone, *Los Angeles Times*, Tuesday, Jan.13, 2004, pp.A1 and A16.

*25- 2003 data from the *International Journal of Circumpolar Health* cited in "Doing Hard Time In Greenland," *Wall Street Journal*, Jan.13, 2004, p.1.

*26- Four scientists writing in Science have revealed that that this island - three times the size of Texas -is losing "51 billion cubic meters of water each year." W.Krabill et al., "Greenland Ice Sheet: High Elevation Balance and Peripheral Thinning," 21, July 2000, cited in Lester Brown, **Eco-Economy**, p.31.

*27- See "Tasmania's Mammmoth Trees Don't Fall Quietly," by Richard C. Paddock, *Los Angeles Times*, March 30, 2004, pp.A1 & A5. See also "Rain Coast," A Film by Cognizant Media, USA, 2004, Producer Geoffrey Holland, in which is described a similar clear-cutting crisis in British Columbia's Great Bear Wilderness, which has seen all but 69 of its original 353 critical life-saving watersheds destroyed by a logging

industry bent on profit and efficiency. And this despite the appeals of the First Nations Haisla People, and ecologists who have pointed out the high number of charismatic megafauna threatened, including grizzly bears, and the second most endangered mammal in North America (after Vancouver's mountain marmot), the Kermode, or White Spirit Bear, which exists in only three of the remaining watersheds, and numbers probably fewer than 200.

*28- "California Crush," by Lee Green, pp. 13-32, *Los Angeles Times Magazine*, January 25, 2004, pp.13-32.

*29- It is also worth recalling that not just California, but America as a whole is the largest per capita and collective consumer in history, and the fastest growing country in the developed world, an algebraic formula for total ecological chaos. In a Public Policy Institute of California 2001 statewide poll, 80% of the population said that "continued growth" was a bad thing. Green, ibid., p.13. That boat reminds one of Garrett Hardin's boat –his life-boat ethic, and the accompanying ecological and moral philosophy of triage, borrowed as a metaphor from the paramedical paradox of World War 1, which saw winners and losers. As Lee Green describes it, "New residents continue to wash over California's borders, but the state is neither attempting to restrain growth nor building adequate infrastructure to accommodate it. And the boat continues to fill."

*30- Described by state Senator Tom McClintock as one who injected "a radical and retrograde ideology into California's public policy." Green, ibid., p.15.

*31- Green, ibid., p.32.

*32- Of the 30 Federally-listed endangered or threatened bird species, only one –the Arctic peregrine Falcon- is showing any signs of recovery. Growth and sprawl have infiltrated increasingly large areas of previous wild forest. Water uptake for those developments has lowered water tables and trees are thirsty, diminishing their ability to ward off bark beetle infestations which kill or weaken the trees' immune systems, making for prime fire habitat, such as erupted in southern California in late 2003. To inhibit further conflagrations, the U.S. Service is now prepared to take out 330 million board-feet of green timber each year in the Sierra, which is 300% higher than in the past. This policy comports with the existing national "Healthy Forests Initiavite," predicated on a methodology that ascribes to clear cutting on public forests as a preemptive remedy of fire hazards. But to do so in the Sierras, officials are discussing lessening restrictions with respect to rare species like the Yosemite toad and California spotted owl, notwithstanding that the U.S. Fish and Wildlife Service has set forth a controversial plan to re-designate 4.1 million acres as "critical habitat" in hopes of stemming the extinction of the red-legged frog. HCPB –Habitat Conservation Planning Branch, "Threatened and Endangered Birds – List and Species." See also "Agency Maps Out 4.1-Million-Acre Frog Haven," by Janet Wilson, *Los Angeles Times*, April 14, 2004, p.B6. See also

*33- See Bettina Boxall, Friday, January 23, 2004, "U.S. to Tripple Logging in Sierra," *Los Angeles Times*, p. B1. See also, "In the Sierras, A Raging Debate Over Clear-Cutting," by Jim Carlton, *The Wall Street Journal*, pp.1, and A10. With respect to other aspects of California's embattled environmental "profile," Governor Schwarzenegger has recently unveiled his "hydrogen highways" program. Currently, there are all of 25 hydrogen/fuel cell vehicles operating in California, the Honda FCX, which the city and county of San Francisco are leasing. The cost of new ones is $1.5 million per vehicle. See "A New Power," n.a., *Los Angeles Times*, April 14, 2004, p.B6.

*34- "German Ordinance on Packaging Waste," 1993; Japanese Packaging Reclycling Law, 1997; European End of Life Vehicles Directive, 2000. Source, Worldwatch Institute, 2002:19. See **Creating Our Future**, p.53.
*35- See "Greens meet to start up a Europe-wide party," AP, *International Herald Tribune*, Feb.21-22, 2004, p.3.
*36- See "Primed for a Fall," by Frank Brown, *Newsweek*, March 1, 2004, p.4.
*37- In listed order of importance: 90%, 88%, 82%, 70%, 70%. Moreover, only 43% of Aucklanders went to the polls to vote in the Auckland Regional Council elections last year –the lowest such rate in the country –but hugely significant in terms of real numbers for New Zealand. Biodiversity, endangered species, global warming, energy futures – hardly a bother. The Metro Auckland Poll, Conducted by TNS New Zealand, November 2003, pp.33-38. Auckland can expect 141,000 more people by 2020. Some have expressed fears pertaining to increasingly tense race relations, crowded schools, loss of green space. In the Netherlands tens of thousands of foreign asylum seekers are being routed and sent home. The traditionally tolerant Dutch, with their teeming 16 million, are finding their borders too narrow, their resource base too finite to perpetuate the myth of an open society. Only Ireland, out of the 25 EU nations, and with the exact same population as New Zealand, remains totally committed to a non-test open immigration.
*38- See "Time for action on jobs," by Vicki Jayne, *Weekend Herald*, March 20-21, 2004, p.C11.
*39- An international labor consulting firm. Loof is managing director. Ibid, p.C11.
*40- The Redesigning Resources programme out of Christchurch is one example, with its emphasis on natural capitalism as a model for moving to a service and flow economy that enhances and restores, rather than merely exploiting, producing, then throwing away. See www.redesigningresources.org.
*41- See "Councils urged to aim at zero waste," by Karen Arnold, *The Southland Times,* Feb.28, 2004, p.3. The zero waste concept adoption has followed the examples of Opotoki, Waitakere City and MacKenzie, where some "80 percent of waste" is said to have been diverted from landfills through recycling and waste minimization, product reuse and composting.
*42- Writes policy analyst Tania Hood with the NEECS –National Energy Efficiency and Conservation Authority, in her address, "Changing the way we think about energy - the role of planners in achieving a sustainable energy future?" op.cit., p.3, "Recently proposed amendments to the RMA will influence the role of planners within the local planning framework. These are the Resource Management (Energy and Climate Change) Amendment Bill (the Energy Bill) expected to be enacted in late 2003, and the Resource Management Amendment Bill No. 2 (the No. 2 Bill), recently reintroduced to the House. The Energy Bill proposes amendments to section 7 relating to energy efficiency, renewable energy and climate change. It is likely to require persons exercising functions and powers under the RMA to give particular regard to the efficient use and development of energy from minerals and other sources of energy, the effects of climate change; and the benefits to be derived from the use and development of renewable energy."
Waitakere is the site of one of the first civic buildings in New Zealand to employ photovoltaic panels, on the Massey Leisure Centre and Library. See "Renewable Energy Enthusiasts See Government Policies Entrench Fossil Fuel Use," by Janine Baalbergen, *EcoLiving New Zealand*, No. 19, 2003, p.30.

*43- New Zealand's uptake of fossil fuel comprises 68% of all her energy use, with an additional 13% geothermal, and 5% renewables, at present. In early March a managing director of British Petroleum Oil New Zealand Ltd. stated that within as few as four years from now New Zealand was staring at an energy insufficiency "to fire (the country's) suite of power stations….If we do nothing we won't have enough electricity towards the end of the decade," he said, suggesting that the country's demand for electricity – growing by 2-to-3 percent per year- required "green power" with special emphasis on liquid natural gas, and geothermal. See *The Southland Times*, Business Section, "BP warns of energy crisis", NZPA, March 9th, 2004. In addition to her small percentage of use of renewables, New Zealand is largely dependent on imports, 32% of its energy use going for oil, 29% for gas; another 7% in coal, 13% hydro. The remaining 13% is expended on geothermal. According to John Blakeley, convenor of the Sustainable Energy Forum, the country's electrical grid and marketplace –having been deregulated- has left a looming sense of power crisis and instability.

*44- Such black-outs were most recently felt in the U.S. northeastern states and Canada – with over 50 million consumers without energy for more than a day- and in Italy, both during 2003. The hydrogen age could level the playing field for all people, restoring power to some two billion people who are entirely off any grid. The same populations, by and large, that are having the most number of children. Yet, it has long been known that when couples obtain electricity, and –especially- television, they produce fewer babies. While babies are not the issue here, dovetailing geothermal capacity with hydrogen might well augment this country's energy grid.

Secretary of Energy for the U.S., Spencer Abraham says, "I think the world will look back on the transition to a hydrogen economy as one of the most important, if not the most important in achievement in our history." And Leo Moli, Principle Energy Officer for Vanuatu remarks in a similar spirit that he is "very happy" to be contributing to his country in this way. Hydrogen may be one of the keys to defusing the population bomb. But hydrogen has the added advantage of also providing for refrigeration, which in turn means safe vaccines and food, and that translates into a lowering of infant mortality, maternal morbidity and nutritional illiteracy, particularly among girls. All of these coordinates result, collectively, in a lowering of the birthrate, and an ecological unburdening. If even 4% of all vehicles in the US were to tap into this new emerging decentralized energy Inernet, of sorts, the need for all existing power plants in America would be eliminated, according to soft energy guru Amory Lovins of the Rocky Mountain Institute. Dr. Zhuo Bin at the Pan Asian Technical Auto Center, in a joint agreement with GM, has already developed the Phoenix Fuel Cell Prototype as the Chinese position themselves to become key players in this revolution. Examples of hydrogen's current effectiveness are legion. Two fuel cells are saving the Conde Nast building at Times Square in Manhattan have eliminated 400,000 watts of outside power. Above Hawaii at 60,000 feet, Helios, the first aircraft powered by a fuel cell –other than the Apollo rockets which took humanity to the moon in the 1960s- is expected to revolutionize the airline and satellite industries. With an electrolyzer embedded in its solar-panelled wings, it is expected to fly for six months at a time and could, in the future enable a single city-circling device of this kind to downlink broadband signal on a footprint without anywhere near the conventional satellite costs. All of these aforementioned developments are in the new one-hour film documentary, "The Hydrogen

Age," Directed by Geoff Holland, Produced by William Hoagland and Susan Leech, Edited by Marc and Michelle Griffith, Hydrogen 2000, & Cognizant Media, CA, 2004.
*45- While Brown declares that not one country has yet managed to engender a sustainable economy, many pieces are beginning to take shape, he says. See pp.81-113 and pp.177-262.
*46- Brown, p.104-106.
*47- Data from the UK indicates that half the country's energy supply, of 68,000 megawatts, even granting England's rainy weather, could be generated from solar. Natural gas is looming as an additional key to the transition to a sustainable energy grid. Gasunie in the Netherlands is one of the major players in the use of natural gas, with its much greater burning efficiency and lower emissions; but plans ultimately to go straight for the wind/solar/hydrogen fuel cell combination, which it evidently plans to export throughout Europe. See Brown, p.113.
*48- A full cup of crude oil is needed for the plastics in disposable nappies, as well 4.5 trees-worth of pulp, or 1.3 million trees per year devoted to New Zealand's toddlers. See "Disposable Nappies: Clogging Up The Landfills For Generations," by Janine Baalbergen, *EcoLiving New Zealand*, Issue 19, 2003, p.15. In other trends within New Zealand there has been a recent emphasis on the "normalizing of sustainability in everyday life." The Manukau City EcoShow in February 2004 was the first such national event of its kind in NZ with a range of topical exhibitions including ecological farming, traditional Maori medicines and food, seed saving, micro-hydro, biogas, wind and hydrogen fuel cells, water harvesting and purification, a variety of energy conservation methods at home, quadruple bottom line reporting, permafarming, micro-hydro, eco-retrofitted houses, and zero waste initiatives throughout the country.
*49 - One calorie of farm animal by-product requires between 11-and-17 calories of feed. Eight ounces of beef, 25,000 liters of water. The resulting waste, even in a country with high environmental marks, like Norway, produced, in 2002, 354 kilograms per person. See **State of the World**, op.cit, p.74.
*50- *Los Angeles Times*, June 7, 2003, p. A1. Because methane is the second most serious greenhouse gas, 20% is no joking matter; especially in light of human demographic pressure for meat, and a current estimate of 1.3 billion cattle, and 1.1 billion sheep and goats in the world. Though most numerous, by a long ways, termites produce little methane relative to bovines, because they contain bacteria which convert hydrogen into vinegar, instead of methane. Several methods are now being study to cut the methane emissions of cattle: the bacteria *Brevibacillus parabrevis* reduces methane emissions by half in the soil. Scottish scientists are wondering if it can work in cows? Swiss scientists have tested saturated fatty acid additives in cow feed. Vaccines are being researched in Australia that might fight methane-causing microbes. Paradoxically, cows not only produce methane from their mouths, they also exhale dimethyl sulphide. It reduces sulphur accumulation from cow diets, and reacts beneficially for the climate with oxygen to help engender cloud formation, and thus a cooling effect. See *Financial Times,* Feb 3/4, 2001, "Why no moos can be good news" by Vanessa Houlder, February 3/4, 2001, p.11. In addition, Canadian researchers are looking at vegetable-oil feed supplements which they believe could cut emissions by 15%. In Australia, eastern gray kangaroos produce no methane but have a similar diet to cows. What's the secret? It would be helpful to know in New Zealand if farmers are to ever pay for methane reduction

research. The cow's 42- gallon rumen contains a bacterium feeding on hydrogen and producing methane when it spits its cud, in the process known as enteric fermentation. Of the 50 pounds or so a cow consumes per day, 6% is lost as methane.

*51- Kyoto Protocol emission units were awarded to 15 New Zealand projects as part of the Government's Projects to Reduce Emissions climate policy. The projects include a hydro works in Hawke's Bay and 50-megawatt wind farm in Manawatu. Together, their abstracted emissions are said to be equivalent to 532,008 tonnes of CO2 between 2008 and 2012, the Government's first so called commitment period to the UN Framework Convention on Climate Change. See "EU draft rules threaten NZ carbon credit cash," by Brian Fallow, *Weekend Herald*, *Business Section,* March 20-21, 2004, p. C5.

*52- The process recognizes even 50 hectare patches if less than 30% of it was covered in trees as of the end of 1989, and is near to seed sources such as coprosma or totara, are eligible. Fencing, predator control, woody weed regrowth which becomes a nursing crop such as gorse, broom, willow, elderberry and tree lucerne are all part of the regeneration process. See Hall GMJ, 2001: Mitigating an organization's future net carbon emissions by native forest restoration. *Ecological Applications* 11: 1622-1633;
See also www.landcareresearch.co.nz/research/greenhouse/carbonposter/carbon.asp.For an example of the type of model that can be used to estimate the potential biomass of New Zealand forests in the future, and consequent carbon storage, see: http://www.ffp.csiro.au/nfm/mdp/nz/nz_fram.htm.

*53- The EU is set to eliminate its ban on the testing of GE crops within Europe; and to allow the 460 million EU consumers the choice to buy GE products, or not. Notwithstanding the massive Greenpeace campaign in Europe, and such hold-outs as Mendocino County, in northern California –the first GE-free region for both crops and animals in North America, nobody knows, as yet, whether this will be a boon to the local economy, or an impediment. See "EU's New Rules Will Shake Up Market for Bioengineered Food," by Scott Miller, *The Wall Street Journal*, April 16, 2004, pp.A1, and A16. In the year 2000 over 100 million acres of farmland were genetically modified throughout the world, 25 times that of just four years earlier. Because the genie has been shipped from the U.S. to China, to India, to Australia, in fields believed to be free of GM, in some products believed to be organic, and because of pollen, wind-blown spores and seeds, and black-market plantings, food experts are now suggesting that every corner of the globe is perhaps irreversibly tainted. See "Biotech Crops Moving Fast Around Globe – Consumers Are Almost Unable to Avoid Genetically Modified Products," by David Barboza, *International Herald Tribune*, June 11, 2001, p.1. Nanotechnology, already an issue for the Greens, adds another layer to the complex agitation. The country's continuing tradition of hybrids –whether among sheep, roses, or, more recently, bees, should pose other environmental concerns.

*54- The issue, according to members of the Milford Sound Governance Group, is not about access, per se, but "capacity" by which they are referring to carrying capacity in the coming decade. And members have added that it appeared that a gondola would not solve the capacity issue but, rather, provide incentives for yet more visitors, thus "diminishing the quality of the visitors' experience and overloading infrastructure." See "Milford access seen as threat", by Cherie Sivignon, *The Southland Times*, March 9, 2004, p.3.

*55- See Richard Tong and Geoffrey Cox, **Clean and Green? The New Zealand Environment**, David Bateman Ltd., Auckland, 2000, p.111. See Dorst, **Before Nature**

Dies, translated by Constance D. Sherman, with a Preface by Prince Bernhard, Houghton Mifflin Publishing Co. Boston, 1970.

*56- Other examples included the image of large trout being easily hooked in wilderness fisheries. In a *New Zealand Herald* article entitled – "Overkill threat to green tourism" Mathew Dearnaley asked what has become a dominant question within New Zealand's eco-tourism business: just how much can the nation's clean, green environment bear in terms of visitation pressures? That, in turn, requires a fitting and descriptive overview of the vulnerability of remaining species and habitats, as well as human infrastructure. Three years ago, with a still low exchange rate vis a vis the US dollar, 1,824 million tourists (roughly the same number of visitors each year to the Anne Frank House in Amsterdam, or 1/38th the number of people who visit Paris annually) left behind 4.7 billion New Zealand dollars, a fraction of the $3.5 trillion global tourist industry. New Zealanders themselves, according to a Tourism Industry Association estimate, spend about $7 billion traveling throughout their own country. March 26, 2001, p. A15.

*57- For years Kenya Wildlife officials knew that overcrowding at national parks like Amboseli was interfering with the mating behavior of big felines. Similar problems of excess contact with humans have affected countless other species worldwide. See **World War III – Population and the Biosphere at the End of the Millennium**, by Michael Tobias, 2nd edition, Preface by Jane Goodall, Continuum Books, New York, 1998. See also the one hour documentary, "*World War III*" by Tobias, JMT Productions, Distributed by Oregon Public Broadcasting, Portland, OR., 1997.

*58- "Massive growth of ecotourism worries biologists"; "The immediate effects on wildlife can change heart rates and social behaviour - the long-term effects could endanger survival," *New Scientist*, March 4th, 2004, Vol. 11, Number 36. In assessing New Zealand population and sustainability concerns, the Parliamentary Commissioner looks at "the quantum of experiential goods and services they (tourists) purchase from sectors such as transport, accomodation and transportation. The resource intensity, or amount, of resources embodied within these goods and services is also important when considering the overall environmental effects of tourism." And he also has acknowledged that "As people (New Zealanders and overseas visitors) move from daily life to being on holiday, their total resource demands per day will change, often quite radically. Many people become more mobile, go into a 'pampering ourselves' mode, and possibly eat and live more luxuriously. Others, of course, choose greater simplicity, eg some forms of eco-tourism, wilderness tramping, or camping at a beach! The key point is that consumption per person is as important a consideration as is total numbers, whether it be in the context of a major New Zealand industry sector, the tourism sector, a city or the whole nation." See op.cit., "The Population Conference – People, Communities, Growth," Te Papa Tongarewa, March 12-14, 1997. <www.executive.govt.nz/96-99/minister/bradford/population/content/pnldis2d/pnld2d_4.htm>

*59- The Top Line chain of holiday homes in New Zealand was the first to create a Green Globe 21 environmental certification scheme, now ten years old, that has been sponsored by the Tourism Industry Association. While there are over 100 benchmarking eco-tourism scenarios worldwide, the three-tiered Green Globe 21 initiative seems to be catching on. Kevin Gough, manager of Top Line, explained that the "People are coming here having seen the marketing images – they have a very sophisticated level of environmental awareness and our members are saying they are embarrassed for New

Zealand's sake when we can't meet those expectations." See "Green means business," by Simon Hendery, *Business Herald*, March 8th, 2004, p.C4.

*60- Little Barrier hosts more than 400 native plants, as well as its celebrated invertebrates like the largest earthworms in the world, and the huge wetapunga, said to grow as fat as a blackbird, has been protected as a wildlife sanctuary since 1895. Trustees of the Little Barrier Island Supporters Trust have come together to help ensure its lasting integrity, an inviolate world of primeval biodiversity. It will not be a place for tourists – because a special permit is required, and not readily granted; but tourists knowing it exists may do more for New Zealand than can be accurately measured.

Writes journalist Lim Li Min, "Though we all like to pay lip service to 'sustainable tourism' –tourism ventures that emphasize ecology, ensure that local communities managing these projects receive profits directly, and minimize sociocultural impact – we're often reluctant to try it. Maybe it's because we don't want to spend our hard-earned breaks living on roots and grubs while staying in a tribal hut. Realizing that the prefix 'eco' has unfavorable connotations to travelers more used to 24-hour room service and pay-TV, a number of operators are trying to take the pain out of political correctness." And he offers several meritorious examples in exotic locales.

A marine park on Chumbe Island in Zanzibar, a tour in the Cordillera Blanca of Peru with a travel company encouraging donations to a trust that plants trees for every mile you fly; to Mamanuca Island in Fiji accepting marine conservation volunteers, to a trip with Bedouins in Jordan where 75% of your expenditures are guaranteed to flow back directly to the villagers, and finally to a UNESCO ecotourism project in Luang Nam Tha, Laos where indigenous peoples in villages throughout a nearly quarter of a million hectare sanctuary will benefit from carefully guided treks.

"Ecotourism Without Tears," by Lim Li Min, *Time Magazine*, Feb.23, 2004, p.61.

*61 -First described in a book by John Elkington entitled **Cannibals with Forks,** Captstone Publishing Ltd., Oxford, U.K., 1997.

*62- And there is a fourth, umbrella index for investing that has now begun to enjoy what can only be described as a fiscal conversion, namely, ethics and ethical investments. In 1999, the Ethical Investment Research Service showed that 77 percent of pension scheme members wanted SRI (Socially Responsible Investments) from their fund managers. However, they did not want SRI if it interfered with returns. And hence, the confusion between "socially responsible" and "ethical". Are they the same thing? What do they mean? Is it a case by case consideration with no possibility for globally uniform criteria, market predictability, or incentives? See "Responsible Business – A Financial Times Guide," Oct. 2001; See also **Perspectives On The New Economy Of Corporate Citizenship**, eds. Simon Zadek, Neils Hojensgard and Peter Raynard, The Copenhagen Centre 2001.

*63- Morely Fund Management, with over 100 billion pounds in assets, looks closely as those corporations listed on the FTSE that have, or do not have environmental reports. Efforts to adjust to SRI thinking have stirred a veritable renaissance in economic circles. From the Global Reporting Initiative of the U.N Environmental Programme, to the UN Global Compact of nine ethical principles announced in Davos in 1998 at the World Economic Forum, deriving, in part, from the Agenda 21 and the Valdez Principles of the late 1980s, following the Exxon oil disaster. Thus far, in the UK approximately half of the 200 largest companies have partaken of SRI accountability, producing reports on their

social and environmental commitments. There is no doubt, given the trends worldwide, that this will become a critical factor in corporate competitiveness. We can also expect to witness a blossoming of creative partnerships, such as the alliance of the Royal Society for the Protection of Birds and the Scottish and Southern Energy corporation to offer what is called RSPB Energy, a "green" tariff. "Juice" –the UK renewable energy brand is another; the WWF endorsement of products suggests yet other avenues, such as its relationship to Unilever –one of the largest frozen fish distributors- resulting in the Marine Stewardship Council. PETA –People for the Ethical Treatment of Animals, examines companies based primarily upon their animal rights and animal welfare records. If, for example, an investor wants to be assured that his/her money will not contribute to the slaughter of animals, PETA's index can be instrumental in providing background data, when available, on a given company.

*64- This shift was first signaled by John Browne, head of British Petroleum in May 1997. In June 2000, ABA, the Swiss multinational power company aimed at a restructuring to become a primarily alternative energy supplier, looking towards combinations of fuel cells, wind, photovoltaics and micro-grids. Brown, ibid., p.247. Consider just some from the list of sponsors and presenters for a Business for Social Responsibility forum in Washington in 2001 that focused on a broad range of environmental affairs, ethics, transparent accountability, sustainable energy, and reduction of impact on the environment. Corporate involvement included Bristol-Myers-Squibb, Chevron, Ford Motor, Motorola, Microsoft, Nike, Novartis, Patagonia, Procter & Gamble, Sony, South African Airways, the Wall Street Journal and Starbucks, among others.

*65- STMicroelectronics in Italy, for example. This revolution in natural capitalism is producing a whole new generation of eco-friendly products. For a definitive overview of the value of biodiversity, see, Edward O. Wilson, **The Future of Life**, Chapter 5, pp.103-128, "How Much is the Biosphere Worth?" Alfred A. Knopf, New York, 2002. Wilson's discussion of Henry David Thoreau, particularly of the importance to the entire planet of invertebrates is also illuminating. In the US an Oregon-based group, the Climate Neutral Network- has now begun marketing an eco-label: Climate Cool. Such companies and events as Better World Travel Agency, as well as the 2002 Winter Olympics, were awarded the trademark. See Brown, ibid., p.262. See also, Andrew Beattie and Paul R. Ehrlich, **Wild Solutions: How Biodiversity Is Money in the Bank**, Yale University Press, New Haven, Connecticut, 2001; Geoffrey Heal, **Nature and the Marketplace: Capturing the Value of Ecosystem Services**, Island Press, Washington, D.C., 2000; Paul Hawken, Amory Lovvins and Hunter Lovins, **Natural Capitalism: Creating the Next Industrial Revolution**, Little, Brown Publishers, Boston, 1999; Robert Repetto and Duncan Austin, **Pure Profit: The Financial Implications of Environmental Performance**, World Resources Institute, Washington, D.C., 2000.

*66- Eco-labeling has been adopted by the Marine Stewardship Council (MSC) for seafood in its certification of the Western Australia Rock Lobster fishery and the Alaska salmon fishery. The Forest Stewardship Council, based in Mexico, and established in 1993 by the World Wide Fund for Nature, has applied similar monitoring and sustainability criteria. As of 2001, there were over 45 participating countries, with a total of 24 million hectares of forest under sustainable management. In the U.S., such stewardship has been embraced by the U.S. Forest Service which now sustainably

manages some 78 million hectares and has reduced timber harvests in national forests from 12 to 3 billion board feet annually. Brown, ibid., pp.245, 273.
*67- The World Bank now plans to have under sustainable management in the countries within which it is working some 200 million hectares of forest by 2005, and 50 million of those hectares under high biodiversity standards.
Brown, ibid., p.177.
*68- "The Hot New Trend: Climate Control," by Katherine Ellison, *Los Angeles Times*, April 25, 2002, p. E3.
*69- "Why charities love Lucy but Not Robbie," by Eleanor Black, "Canvas," *Weekend Herald*, March 20-21, 2004, pp.10-11.
*70- Cf. New Zealand with the average European Union households which manage to save over 8% of their income per year. Cited in **Creating Our Future – Sustainable Development for New Zealand – Sustainability Indicators,** Office of the Parliamentary Commissioner For the Environment – Te Kaitiaki Taiao a Te Whare Paremata, Wellington, June 2002, p.55.
<www.pce.govt.nz/reports/allreports/1_877274_03_8.shtml>
And according to a UN study in 1998 expenditures on advertising in New Zealand were said to equal Britain, exceeding all other countries in the developed world, as a percentage of GDP.
*71- op.cit., Eleanor Black, "Canvas," *Weekend Herald*, March 20-21, 2004, pp.10-11.
*72- See - *Association of Fundraising Professionals - Advancing philanthropy through education, training, and advocacy, "*The Case of The Disappearing Donor," By Jacklyn P. Boice, citing *The Chronicle of Philanthropy*, October 31, 2003. An flipside to this, however, concerns the recent U.S. General Accounting Office report citing that between 1996-2000, "61% of American corporations paid no income tax." See "In Brief," *Los Angeles Times*, April 3, 2004, p.A10. Last year, a U.S. oil company donated leases on over 4,000 acres of a canyon decorated with sacred American Indian rock art to a nonprofit organization, the U.S. National Trust for Historic Preservation. This was possibly a first for corporate philanthropy on the U.S. and suggests a whole other avenue for charity worldwide.
*73- Whether by incorporation of ecological effects into certain pricing structures, the taxing of non-eco-labeled products, or simply the use of taxes to reward ecological effects, whilst discouraging harmful causes. Cited in Brown, **OECD Environmental Outlook**, Paris: 2001, p.251.
*74- The consideration therefore arises as to how to engender an overall strategy that encompasses every environmental cause and consequence, divided reasonably between the polluters, and the victims. How to distribute risk, liability, and be both equitable, reasonable and proactive about it? Those environmental causes and effects must include all aspects of biodiversity, the biological bottom-line, as well as an ethical set of priorities that would butress animal, plant and habitat rights. How does one bolster all the so called sub-sets, be they the environmental effects of cruise ships, increasing biosecurity risks and costs, or the waste discharges and accompanying environmental health risks associated with an intensive farmland sector in a tax strategy? If there is no way to unify the picture of damage being done to the environment, how does one go about taxing citizens, lacking a unified logic?
See Brown, ibid., pp.235-251.

*75- For example, contrary to the list of concerns suggested by the MetroPoll of residents of Auckland previously described, those citizen responses to the Parliamentary Commissioner sampled over a five month period ending August 31st, 2003, suggest very different issues and concerns. In order of priority: administration and implementation of the RMA, Mining, Pollution, Roadworks, then Biosecurity, Coastal and Fisheries management, waste management, conservation and natural heritage resources. Constitutencies vary dramatically. The country's farmers would look for tax relief following the disastrous floods in February of 2004. But it is unlikely that city dwellers would think to be recompensated for an increased cost of their broccoli. Moreover, who, or what set of historical processes, rulings, zoning, and environmental missteps, might be party to the disastrous outcomes of flooding, or other natural disasters. Are insurance premiums the only viable index for monitoring bottom line ecological consequences? If they were –whether the prospect of increased hurricanes from global warming, or expanding flood plains- then, by analogy, one would want to compute dollar amounts for insuring wild native species and habitat. If a species were to go extinct –which they do with increasing regularity- what sort of compensation might be expected? Conversely, following the "polluter pays" concept, might the future of conservation also look for compensation for damages from those responsible for an extinction, however retroactively? How does one calculate the value of a species in non-material terms? There are legal precedents for the value of a human being, which vary dramatically from country to country, and case to case; but what about birds, insects, trees, ecosystems?
*76- As one farmer in the U.S. recently lamented in an L.A. Times interview, "All wealth comes from the land…Logging, mining, farming, grazing…I'm not greedy, but I would like to make a profit." Whether one can add "national parks" to such wealth has not yet been fully addressed. Does a park, for example, connote greater sustainability for the country than a collection of well-managed farms? The question matters, but only if a community can manage to attribute sufficient economic priorities to conservation to render the computation meaningful to those communities. And if not, then what is the true future of conservation, as weighed against a nation's economic priorities? In some South African parks, the wildlife are having to pay for their keep, and that means culling. These are demanding queries which are sure to be supported, or vehemently opposed according to whose livelihood may be involved, or how such livelihoods are perceived in the short and long term as intrinsically beneficial to the sustainability of New Zealand as a whole. People whose lives depend on extractive industries, like farming, will have a different time horizon than a policy analyst, a forest manager, an animal welfare officer, a solicitor, a voter in some other part of the country, or a district or regional planner. Let alone an eco-tourist. See "Sheep Producers in U.S. Feel Pinch of Global Market," by Tom Gorman, *Los Angeles Times*, Dec.26, 2001, A37.
*77- The spraying of effluent into paddock has been largely discredited by now. The alternatives: compost, effluent pits with microbial introductions, methods for curbing the plugging and compaction of soil from cattle movement, the use of pumice for track building, and the planting of greenbelts to absorb excess nitrogen. See "Lake Taupo In Crisis," by Rowan Lindsay, *EcoLiving New Zealand*, Issue No. 19, Feb. 2004, p.9.
*78- Statistics New Zealand, 2000.
*79- See "Fears for farming," *The New Zealand Herald,* Feb.26th, 2004, na, p.A9.

*80- The irony is that France, with 60 million people, seeks a spiritual, non-competitive approach to the landscape –a largely family farming tradition deemed to be sustainable- but now out of fashion in much of the world. See "French farmers a dying breed," by Liam Dann, *The New Zealand Herald*, Monday March 22, 2004, p.C4.
*81- The numbers are increasing by 5% per year. In addition, there are hundreds of thousands of deer and other livestock. See United Nations Food and Agriculture Organization statistics, cited in "French farmers a dying breed," by Liam Dann, *New Zealand Herald*, Monday March 22, 2004, p.C4, and op.cit., Tong and Cox, p.33; see also, "Five Years of the 'New' Animal Welfare Regime: Lessons Learned From The New Zealand Experience with Farm Animals and Animal Welfare Legislation," by Dr. Peter Sankoff, University of Auckland Faculty of Law and Co-Chair of the Executive Committee of the Animal Rights Legal Advocacy Network, New Zealand (ARLAN), paper presented at the Animal Rights Law Conference, San Diego, CA, March 28, 2004, p.2. Dr. Sankoff's numbers, were in turn cited from "MAF's Animal Welfare Mission", Ministry of Agriculture and Forestry Publication, 1999.
*82- Giardia and Leptosporidium, among others. Op.cit., Tong and Cox, pp.58-59.
*83- By the early 1990s, a survey by New Zealand's Ministry for the Environment yielded nearly 7800 chemically contaminated sites throughout the country, excluding agricultural and horticultural sites –another 4,000 potential sites, wherein heavy applications of such ordinary compounds as 2,4 D-butyl ester had been in use. See Tong & Cox, pp.70-77. It is only the country's prevailing westerly winds and relatively low population which helps obscure the reality of a nation with sobering pollution issues. 80% of New Zealand materials production is un-reused or recycled.
*84- At least one Senior Lecturer at the Department of Geography at the University of Waikato has challenged conventional thinking by suggesting that in some sense these numbers represent a true increase in biodiversity, not a loss. "Biodiversity Planning with 50/50 vision," *Planning Institute of New Zealand*, annual conference, Hamilton, May 23, 2003. "… by 2000," says Mairi Jay, "the number of terrestrial higher native plant species in New Zealand was 2,350, while the number of naturalised introduced plants was 2,020, and the number of introduced, but not yet naturalised plants was 22,600. See "Space Invaders, A summary of the Department of Conservation's Strategic Plan for Managing Invasive Weeds," Department of Conservation, Head Office, Wellington, 2000.
*85- **The Southland's State of the Environment Report for Water**, October 2000, p.29. A figure that includes the costs associated with the intervention in the TB vector between possums and livestock but can not begin to adequately account for the disappearance, or near disappearance of native species. No one has yet come close to assigning appropriate "dollar value" to native –or non-native life forms, although to do so may be the only honest way to approach the future of funding for conservation. The predator knock-down, control and eradication industries raise a host of brutal uncertainties and ethical quandaries; by what means human beings address, and subscribe to change –change that involves destruction, and a total shift in landscapes and the tapestry of life inhabiting those landscapes. New Zealand's future biological hierarchies will necessarily be hybrid ones, though some precious fragments will remain as New Zealand conservation escalates its focus upon the restoration of what appears to have been here for tens-of-thousands of years prior to the heavy hand of man.

*86- See just some of the 592 web entries and articles (as of March, 2004) for New Zealand immuno-contraception:
a) www.gene.ch/genet/2001/Oct/msg00035.html; b) **New Zealand** struggles about GE; "Feasibility of Immunocontraception for Managing Stoats in New Zealand," Science For Conservation 158, by L.A. Hinds, C.K.Williams, R.P.Pech, D.M.Spratt, A.J.Robinson, and G.H.Reubel, Department of Conservation, Wellington, December 2000; www.conservation.bio.mq.edu.au/people/des_print.html; c)**[PDF]** POSSUM - MANAGEMENT IN **NEW ZEALAND -**"using egg antigens as a humane method for reducing possum" www.pce.govt.nz/reports/allreports/ Possum_Critical_Issues.pdf; d) Nelson Marlborough Farming - Rural News from **New Zealand "...** In **New Zealand**, MAF recently estimated that approximately 70 million possums **...** GMO) and methods that stop breeding such as **immuno-contraception** or sterilization" - www.ts.co.nz/~rick/nmf/articles/poison.html; e) marsupial crc- managing marsupial abundance for conservation **..."...** of political, ethical and safety constraints in Australia and **New Zealand" -** www.**new**castle.edu.au/discipline/biology/marsupialcrc/marsupsymp/emergetech.html; f) "Fertility Control of Problem Populations –"**... New Zealand** mammals considered to be pests or problems. *Reproduction, Fertility and Development* 9: 27-36 Barlow, ND (1997): g) Modelling immunocontraception **...** www.marsupialcrc.com.au/webhome/ FACTS/FertilityControl.htm; h) Mar 31, 2004 -**"...** possums, and gives a glimpse into the future, including immunocontraception, and creating **...** people aware of the impact of possums on New Zealand's biodiversity," www.landcareresearch.co.nz/**new**s/ release.asp?Ne_ID=40; I) "Cute Australian Possums are Public Enemy Number One **...**The New Zealand government now has to find alternative ways to manage the **...** Immunocontraception is another method being considered as a way of reducing numbers **...**" ezdragon.cortland.edu/log/au/au176/au176.htm
j) New Scientist -**"**The immunocontraception idea has already been proved in another major pest, the European house mouse." **"Virus could sterilise Australia's rabbits,"** August 7, 2002; k) New Scientist, "Australia wages gene war on invasive fish," May 8, 2002; l) New Scientist, "An engineered mouse virus leaves us one step away from the ultimate bioweapon," January 10, 2001; m) See also: Charles Pickett and Robert Bugg, eds., **Enhancing Biological Control: Habitat Management to Promote Natural Enemies of Agricultural Pests**, University of California Press, Berkeley and Los Angeles, 1998.
Ethically, the dilemma here is intense. A Buddhist, a Jain, anyone with a comprehensive philosophy of non-violence will be challenged by New Zealand's conservation emergencies, and the whole necessary realm of prioritizing and of biological triage. However, even within such esteemed spiritual traditions, there is ample latitude for "self-defense," for preventing harm to others, and for the recognition that absolute non-violence in this world is impossible. See **A Vision of Nature –Traces of the Original World**, by Michael Tobias, Kent State University Press, Kent, Ohio, and London, 1995. See also, **A Naked Man**, by Michael Tobias, Jain Publishing, Freemont, CA, 1994. See **A Parliament of Souls –In Search of Global Spirituality**, ed by M.Tobias, J.G.Morrison and B.Gray, a 28-part KTEH-PBS/Vision Network Television Series and KQED/Bay Books publication, 1998. See also the comprehensive World Religions and Ecology Series, published by the Harvard Divinity School's Center for the Study of

World Religions (CSWR), directed by Mary Evelyn Tucker and John Grim, including: **Indigenous Traditions and Ecology –The Interbeing of Cosmology and Community**, ed. By J.Grim, 2001; **Hinduism and Ecology: The Intersection of Earth, Sky, and Water**, ed. By C.Chapple and M.Tucker, 2000; **Jainism and Ecology: Nonviolence in the Web of Life**, ed. By C.Chapple, 2002; **Buddhism and Ecology: The Interconnection of Dharma and Deeds**, ed. By M.Tucker and D.R.Williams, 1998; **Confucianism and Ecology: The Interrelation of Heaven, Earth, and Humans,** ed. By M.E.Tucker and J.Berthrong, 1998; **Daoism and Ecology: Ways Within a Cosmic Landscape**, ed. By N.J.Girardot, J.Miller, and L.Xiaogan, 2001; **Judaism and Ecology: Created World and Revealed Word**, ed. By H.Tirosh-Samuelson, 2002; **Christianity and Ecology: Seeking the Well-Being of Earth and Humans**, ed. By D.T.Hessel and R.R. Ruether, 2000; **Islam and Ecology: A Bestowed Trust**, Ed. By R.C. Foltz, F.M.Denny, and A.Baharuddin, 2003. The consideration of the complex tapestry of human beliefs which are the world of comparative religions and indigenous spirituality places an additional burden on all biosecurity methodologies and thinking.

*87- However, 99% of existing safeguards lie within the Kermedec and Auckland Islands. Yet, conclusively, the return of some abundance occurs rapidly after reserve status, as around Goat Island where crayfish are said to be 20 times more plentiful today than before protection, even allowing for overflow of species into non-reserved ocean regions. See www.doc.govt.nz/Conservation/Marine-and-Coast/Marine-Reserves/index.asp; see also, op.cit., Tong & Cox, p.44.

*88- Conversation with Alan Saunders, IUCN Invasive Species Representative from New Zealand.

*89- The concerns voiced included water contamination and non-target species, particularly deer. The other worry was that it would put off tourists. The region in question concerns 19,454 hectares in the Clinton, Arthur and Cleddau Valleys of Fiordland.

*90- "1080 drops to target valleys," by Phil McCarthy, *The Southland Times*, March 18th 2004, p.9.

*91- According to DoC technical support officer Bruce McKinley. See "Biodiversity strategy promoted," a staff reporter, *Otago Daily Times*, December 16, 2003, p.15.

*92- ibid., *Otago Daily Times*, p.15.

*93- Ecologist Dr. Andrea Julian was commissioned by Auckland City councilors to research and prepare the document. See "Highway threat to 'key area'" by Brian Rudman "Rudman's City column," p.A2, *The New Zealand Herald*, Friday March 19, 2004, p.A2.

*94- See "Exporters keen on lignite proposal," by Karen Arnold, *The Southland Times*, Tuesday March 16, 2001, p.1. In this case, the issue was a recent exemption request for a proposed silicon refinery and lignite fired power generation plant.

*95- **Water: State of the environment report**, p.6.

*96 - ibid., p.12.

*97- How does one get at the whole environmental story (or "ecological truth" as ecological economist Ernst von Weizsacker of the German government has described it). In Indonesia, every village is tracked by the BKKBN for its residing number of pregnant women. The bureaucracy for such population control is enormous and involves the mapping of every woman's monthly cycle. I think many would find such "mapping"

intrusive. See "No Vacancy," Written & Directed by Michael Tobias, Dancing Star Foundation/Population Communication, 2004. See also Brown, op.cit., p.143.
*98- op.cit., **State of the environment report**, p. 13.
*99- Not as painful a description as that first documented European encounter with a takahe in 1849 at Dusky Bay which suggested that the creature "ran with great speed, and upon being captured uttered loud screams, and fought and struggled violently." See, "Takahe: The bird that twice came back from the grave," by Alison Balance, p.19, in **The Takahe – Fifty Years of Conservation Management and Research**, ed. by William G. Lee and Ian G. Jamieson, University of Otago Press, 2001. Some of Southland's other indigenous fresh water fish are diadromous, migrating from marine environments into freshwater. Any impediment –such as a dam, or other diversion- threatens their existence, and deprives the earth of a great mystery that biologists have scarcely begun to fathom.
*100 - *Galaxias fasciatus*.
*101 - Pathogens are, in fact, on the rise in Southland, such as *campylobacter* and *Cryptosporidium pavrum.*
*102- See "*INSIGHT*," -Radio New Zealand National Programme, Monday 18 June 2001; 9.06pm, "Melanie Thornton looks at why private landowners are foregoing economic profit, and setting aside their land for conservation." "Populist conservation in New Zealand in the year 2001"
*103- See **Values As Law: The History and Efficacy of the Resource Management Act**, by David Young, Institute of Policy Studies, Wellington, 2001.
*104- ibid., Young, p.34.
*105- The **McShane Report** of 1998, ibid., Young, p. 41.
*106- Julie Frieder, **Approaching Sustainability: Integrated Environmental Management and New Zealand's Resource Management Act**, Ian Axford New Zealand Fellowship, Wellington, 1997, p.55, cited in D.Young, op.cit., p.54.
*107 ibid., Young, p.86, p.89. Moreover, in March 2001, longtime environmental activist Guy Salmon told David Young in a published interview, "We're marching along making the same mistakes that Europe has made for the last 50 years. The difference between them and us is that they're turning that around. They're regulating farmers, they're spending huge sums of money to clean the place up and we're doing nothing…because we believe that we're clean and green. Very depressing." See Young, p.54.
*108- She characterizes this as a "new energy" that is galvanized, sophisticated, and benefiting from over a century of knowledge from conservation efforts worldwide. Mairi Jay is Senior Lecturer in the Department of Geography at the University of Waikato. She cites the Maungatautari Ecological Island Trust, Karori Wildlife Sanctuary, the Brooks Sanctuary in Nelson, and the Waikato Biodiversity Forum among others. "Biodiversity Planning with 50/50 vision," Hamilton, National Planning Institute, 2003. Elsewhere, that surge is noted by corporate visionaries within the ecological restoration realm. Consider, for example, In Australia, at a predator-fence enclosed wildlife sanctuary called Warrawong, near Adelaide, John Wamsley founded Earth Sanctuaries Ltd, a publicly traded company whose proceeds are aimed at perpetuating other such fenced sanctuaries that will keep out non-native predators. Wamsley believes that such funding mechanisms are the only way to actualize "measurable outcomes." His track record to date in saving endangered species would seem to confirm his beliefs and have become mainstream

enough to have been described in National Geographic Magazine. See Jennifer Steinberg Holland, *National Geographic*, December 2003.
*109- See "Marine Reserve for East Coast," Number 294, November 1999, p.5.
*110 – "Where do planners fit into this equation? Will they be part of the problem, or part of the solution?" she asks. See Mairi Jay, op.cit., "Biodiversity Planning with 50/50 vision," p.5.
*111- In as much as this nation has hinged much of its comparative advantage and, hence –economic future, upon the 100% clean, green Pure image, there is an added burden, not just economic, but moral, to uphold its promise to all those visitors and consumers worldwide who are looking up to New Zealand environmentally. That includes the country's treatment not just of wildlife, but domestic life, as well. In its document, **Creating Our Future – Sustainable Development for New Zealand – Sustainability Indicators**, concepts such as "hidden ecological cost," "ecological footprint" and "carrying capacity" were powerfully in focus. **Creating Our Future** acknowledges that "New Zealand's economy has been dominated by 'quarrying' rather than sustainable use…We come from a line of immigrants, first hunters and gatherers, then pioneers and exploiters of natural capital," the document declares. "All have contributed to environmental modification including species extinctions, introduction of pest species and removal of forests." See Office of the Parliamentary Commissioner For the Environment – Te Kaitiaki Taiao a Te Whare Paremata, Wellington, June 2002. See also the following: **Caring for the Earth, A Strategy for Sustainable Living**, Published in partnership by The World Conservation Union (IUCN), United Nations Environment Programme (UNEP) and World Wide Fund For Nature (WWF), Gland, Switzerland, 1991: **The State of New Zealand's Environment, 1997**. **What is Happening Now with the National Policy Statement on Biodiversity?** Ministry for The Environment, Wellington. MfE (Ministry for the Environment) 2003, Ministry for the Environment webpage information. http://www.mfe.govt.nz/issues/biodiversity/responsibilities/private-land/nps/happening.html); **Our Common Future,** World Commission on Environment and Development, Oxford University Press, Oxford and New York, 1987. See p.10.
*112- That number refers strictly to domestically-produced food by-products, and does not begin to encompass other animal by-product consumption by New Zealanders from domestic and international sources. See Sankoff, op.cit., pp.1-2.
*113- According to Peter Sankoff, a faculty member of the University of Auckland Law School (Lecturer, and Co-Chair of the Executive Committee of the Animal Rights Legal Advocacy Network, New Zealand, or, ARLAN) those reforms included "the practice of cow tail docking, transporting animals long distances for slaughter, and de-horning deer without anaesthetic amongst others." See Sankoff, p.4.
*114- Peter Sankoff, op.cit., p.4. He cites the AWA, s.4.
*115- Agriculture Minister Jim Sutton extended four of the codes by a year saying that "nobody could have predicted the complexity and level of public interest the codes of animal welfare would attract." "Government extends four animal welfare codes", *The New Zealand Herald*, Dec., 22 2003, p. A11.
*116- Sankoff, supra. p.6.
*117- *Facts About Furs*, EU Council Regulation No. 3254/91.

*118- It is to this realm that consumers, international jurisprudence, and more and more farmers, have been rightly focused. Concomittently, what causes emotional and physical stress in animals has undergone both scientific and legal revisions with dramatic effect, of late. In North America, a recent state Court of Appeals decision in Tacoma, Washington has established the amount of pain required for a cruelty conviction with respect to a case involving two emaciated horses: "mild discomfort" was enough to convict the horses' keepers, and it defined pain as everything from "mental uneasiness" and "dull distress" to "unbearable agony." "This is landmark," said Adam Karp, founder and board member of the Washington State Bar Association's animal-law section. The second-degree animal-cruelty law makes it a misdemeanor to knowingly or negligently cause "unnecessary" pain, though does not define pain. See -*Washington State AP Wire*, "Appellate court defines "pain" for animal-cruelty cases," January 27, 2004. For two thorough Bibliographies of Animal Welfare, Animal Rights, Animal Liberation, and the many issues inherent to each, see Jane Goodall and Marc Bekoff, **The Ten Trusts –What We Must Do To Care For The Animals We Love**, HarperSan Francisco, 2002, pp. 187-200; and Jeffrey Moussaieff Masson, **The Pig Who Sang to the Moon,** Jonathan Cape, London, 2004, pp.263-276. The documented concern about pain in other species than ourselves dates back, at least, to early Jain traditions in India, as outlined in the **Jaina Sutras**, Part I, *The Acharanga Sutra*, and *The Kalpa Sutra*, translated from Prakrit by Hermann Jacobi, Motilal Banarsidass, New Delhi, new edition, 1980. See also **Aspects Of Early Jainism [As Known from the Epigraphs]**, by Jai Prakash Singh, Banaras Hindu University, 1972. The pre-Socratic philosopher, Thales of Miletus (circa 663-545 B.C.) as well as the later Pythagoras (active 530 B.C.) both extolled the importance of non-violence towards the environment, which included for them other animals. In China, the great Daoist phiolosopher Lao-tzu acknowledged similar injunctions which would inform the history of Chinese aesthetics and environmental ethics, at least until the Southern Sung Dynasty. Porphyrius, a pupil of both Longinus (who wrote on the "Sublime") and the great neo-Platonist philosopher, Plotinus, himself authored the first book in western history on vegetarianism. (For the most comprehensive overview of Western environmental thought, see Clarence Glacken's **Traces on the Rhodian Shore: Nature and Culture in Western Though From Ancient Times to the End of the Eighteenth Century**, 2nd edition, University of California Press, Berkeley, 1976.) Leonardo Da Vinci, a vegetarian was also extremely outspoken with respect to the animal cruelty he saw in his day. The eighth Ashikaga Shogun Yoshimasa (1434-1490) for nature that would, in turn, become a defining moment in the history of the Japanese nature aesthetic. Most succinctly, it was Jeremy Bentham (1748-1832) who translated this long, compelling history of concern for nature into the basis for a legal and psychological orientation, when he wrote of animals, "The question is not, Can they *reason*? Nor Can they *talk*? But, Can they *suffer*?" (See his **Introduction to Principles of Morals and Legislation**, published in 1789). Some of the first anti-cruelty statutes were enacted among the original colonies in America during the 17th century. But it was in 1809 that one of the first anti-cruelty speeches was delivered before Parliament in London by none other than Thomas Erskine, Lord Chancellor of England. His rousing "testimony" would ultimately trigger the anti-vivisection movement, and the modern animal welfare revolution. Percy Shelley's "A Vindication of Natural Diet," was written shortly thereafter (See **Shelley, Selected Poetry, Prose and Letters**, ed. By A.S. B.

Glover, Nonesuch Press, London, 1951, pp.900-913) and in 1823 Porphyry's book was first translated into English by Thomas Taylor.
*119- The SPCA has called upon the whole country to agitate for a new review by the National Animal Welfare Advisory Committee; to boycott all but meat clearly labeled as free range or organic. "Pork industry decision a 'national disgrace'", *Animals' Voice*, Spring 2001, pp.,34-35.
*120- See Dr. Ingvar Ekesbo, "A Successful System for Housing Pregnant Sows in Groups," *AWI Quarterly*, Winter 2004 Volume 53, Number 1, page 6. The system has been described by the University of Minnesota's former sustainable swine scientist, Dr. Rebecca Morrison: "We have been overwhelmed by the success of this alternative housing system for gestating sows…and we have received many positive comments from the stock people working with the sows." (ibid., p.6). In examining other systematic and devastating particulars. These include the fact that "most of the codes were primarily drafted by representatives of the various industries that would be governed by them"; (Sankoff, p.7.); that necessary reform and revision of the codes, still pending in most cases, have seemed by the actions to deliberately eschew existing international research with respect to pain and suffering in animals; and that MAF's own supervisory role may be in conflict.
*121- Sankoff, ibid., p.11.
*122- Sankoff, ibid., p.12.
*123- The Scientific Committee of Animal Health and Animal Welfare in the Europe Union has thoroughly analyzed these. Sankoff, ibid., p.12.
*124- Prosecutions brought forth by investigators are often left in the lurch because, as Sankoff points out ("There is, effectively, no legal assistance available, a situation that does not appear to exist in other jurisdictions." P.14); moreover, personnel restrictions of Animal Welfare Group within MAF responsible for such investigations and prosecutions severely limits the latitude of possible vigilance and/or prosecutions (Sankoff, p.15) and places an even greater burden on the non-profit SPCA. Such circumstances meant that, for example, in 2002, confronted with approximately 12,000 complaints nationwide, the SPCA was able to muster charges against approximately half of 1% of the possible offenders. (Sankoff, pp.18-19 New Zealand is by no means alone in this crisis of animal welfare. In July 2001 Democratic Senator Robert Byrd of West Virginia delivered a landmark speech and called upon the U.S. Department of Agriculture to work far more seriously towards diminishing the pain and cruelty involved in factory farming, and demanded an additional $3 million per year to enforce the ***U.S. Animal Welfare Act and humane Slaughter Act.*** From India, to Germany's Westphalia, animal rights legislators have been pushing hard to try and improve often deplorable situations for animals.
*125- Sankoff, ibid., p.20.
*126- Sankoff, ibid., p.20, cited from G. Fairbrother, "The Animal Welfare Act: Friend or Foe?", S.A.F.E. website at http://www.safe.org.nz/information/articles/law.php
*127- Sankoff, ibid., p.20, cited from S. Fox, "Cruelty Sentence Pathetic", *East & Bays Courier*, April 2003, p.2.
*128- Dalton is a former research scientist and technical editor of www.lifestyleblock.co.nz.
*129- Dalton believes the reason for the widespread hunger among cows in New Zealand stems from farmers deliberately missing condition scoring ratings; or, says he, they

simply don't know better. The difference between CS 5 versus 4 translates into about $19,000 for a herd of 300. The issue hinges upon a discrepancy between a half-and-2 points in a 40-year old tradition of condition scoring that suggests that "cows must calve at CS5 (with heifers at 5.5) and stay around 4 to 4.l5 while milking at their peak." See "The land of the skinny cow," by Dr. Clive Dalton, *Animals' Voice*, Summer 2001-2, p.32.

*130- See **State of the World**, op.cit, p.13.

*131- Sankoff, supra., p.21.

*132- SPCA v. Berryman and Murphy, cited by Sankoff, p.21. This thinking tends to comport with the popular cultural consideration of sheep by an essentially meat eating nation. Consider, most recently, an article entitled "Future Focus –Diversification down on the farm," by Kim Griggs, which opens with the headline, "Don't think sheep, think lamb cutlets." *Biotech Unlimited*, April 2004, p.8 of supplement. This is a mindset that is certainly not limited to New Zealand. And it affects both domestic and wildlife as communities struggle to relate to them, whether on private land, such as farms, or in public spaces, such as National Parks. Writes geographer Suzanne M. Michel, "…within planning public spheres, especially those concerning wildlife habitat spaces, peaceful resolutions between special interest groups are a rarity." ("Golden Eagles and the Environmental Politics of Care," in **Animal Geographies – Place, Politics, and Identity in the Nature-Culture Borderlands**, Edited by Jennifer Wolch and Jody Emel, Verso, London, New York, 1998, p.173.

*133- And more and more large retailers both in New Zealand and abroad who purchase product from New Zealand farmers are demanding in their contracts with vendors that they initiate more humane standards with respect to shade and protection for the animals, and the provisioning of measures to mitigate effluent run-off in riparian zones. "Make money grow on your will trees," *The Southland Times*, March 16, 2004, p.17. He discusses a MAF funded sustainable farming fund that has been researching the use of tree fodder, particularly poplars and willows that can be used for supplementary feed, but also for shade and shelter for the animals. Farmers here as in Europe are rightly concerned about certain trees, like *Pinus radiata* or *marcrocarpus* inducing abortions in animals that feed on them; or the problems associated with barley grass seeds getting in the eyes of sheep and potentially blinding them. See the various **Proceedings of the New Zealand Grasslands Association**; see also Dr. Deric Charlton, ed., **Using Trees on Farms**, New Zealand Grasslands Association, Palmerston North, 2003. See also – www.grassland.org.nz

*134- See Stephen R. Kellert, **The Value of Life: Biological Diversity and Human Society**, Island Press/Shearwater Books, 1996; See also, Richard Bennett & Rallph Blaney, "Social Consensus, Moral Intensity and Willingness to Pay to Address a Farm Animal Welfare Issue," 23, *Journal of Economic Psychology*, 2002, pp.501-520. See http://www.sciencedirect.com/science/journal/01674870.

*135- Cited on p.50 of **Creating Our Future – Sustainable Development for New Zealand – Sustainability Indicators,** Office of the Parliamentary Commissioner For the Environment – Te Kaitiaki Taiao a Te Whare Paremata, Wellington, June 2002. In addition, the report states, "there are significant economic risks for New Zealand if the reality does not live up to the image." P.7. See "Valuing New Zealand's clean green image," Ministry for the Environment, MFE, Wellington, 2001.

*136- See his recent book **The Pig Who Sang to the Moon –The Emotional World of Farm Animals**. Jonathan Cape, London, 2004, p.1. And he adds, "I just do not believe that anybody will take care to give an animal a 'good life' if the point of that life is to end up as a meal on the table." Ibid., p.3.

*137- The revolution in cognitive ethology –research into the intelligence, communication skills, and capacity for suffering in animals throughout the world, championed by thousands of scientists like Jane Goodall- demands a re-consideration by planners at all levels. Somewhere between shrimp and oysters, many ethologists now see the rise of consciousness and all that it entails. A team at University College in London recently studied physical pain in humans and then attempted to understand whether the partners of those in pain might feel anything like the pain their loved ones were enduring. The answer was, yes, they did. The implication: the same occurs in other species, and that includes animals doomed in a slaughterhouse. The scientists found that the anterior cingulated cortex, the insula, thalamus and somatosensory cortices are all activated in humans when they see another person sees that individual in pain. In other words, we empathize neurophysiologically. Only the somatosensory cortices remain unactivated. But emotionally, psychologically, we are there. Other primates are as well: they contain mirroring neurons that have been discovered to be activated when they, in turn, see others of their kind in pain. With respect to oysters, many animal behaviorists and philosophers believe that "somewhere between the shrimp and the oyster" there is consciousness. See Emily Eakin, "No Longer Alone: The Scientist Who Dared to Say Animals Think," *New York Times*, February 3, 2001, p. B11. Observational studies include data on evidence of pain in fish, and various expressions of a sophisticated sort in prairie dogs, crows, pigeons, sheep, elephants, western evening grosbeaks, bees, African antelope, rhesus monkeys, and red foxes, to name but a few. See "A Review of **Minding Animals: Awareness, Emotions, and Heart**," by Dr. Marc Bekoff, review by Michael Tobias, *Animal Law*, Lewis & Clark Law School, Volume 9, 2003, p.327. Bekoff's book was published by Oxford University Press, New York, 2002. However, in one notable instance, invertebrates have posed a legal hurdle. Despite New Zealand conservation's love affair with the weta, the country's AWA of 1999 will not concede feelings or pain to insects. See Ministry of Agriculture and Fisheries, **The Animal Welfare Act – A Framework for the 21st Century**, <http://www.maf.govt.nz/biosecurity/legislation/animal-welfare-act/index.htm>

*138- From *The London Times*, Feb. 20, 2004, an article by Nigel Hawkes, Health Editor.

*139 - Or, as E.O.Wilson has written, "As a new century begins, we have begun to awaken from this delirium. Now, increasingly postideological in temper, we may be ready to settle down before we wreck the planet. It is time to sort out Earth and calculate what it will take to provide a satisfying and sustainable life for everyone into the indefinite future. The question of the century is: How best can we shift to a culture of permanence, both for ourselves and for the biosphere that sustains us?" p.22, op.cit., **The Future of Life.**