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REVENUE LAW AND THE ENVIRONMENTAL LEGAL SYSTEM

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1. OVERVIEW

Due to the dominance of neoclassical economics over the world's markets, the value of resources extracted from, and of pollution emitted into, the planetary environment has been largely disregarded & discounted. This has led to ruthless private exploitation of the global "commons", manifesting in unrationed extraction of raw resources and damage to land, rivers, sea & air. Only by integrating economics with ecology[1] can "sustainable development", which meets current needs without compromising the future, occur. That integration cannot be left up to profiteering industry nor indulgent indigenous governments and requires forceful intellectual demand.

To some extent, in the more developed nations, environmental externalities have been curtailed by "command & control regulation", but the bulk of the externalities (especially non-point pollution) continue unabated, with severe effects upon human health & viability, other species, global climate and intergenerational equity.

It is possible to minimize central planning & state control, yet to retain the free market as the facilitator & regulator of production & exchange, provided that the environmental legal system adopts appropriate economic instruments which address & redress these externalities. In this way a true & viable economic efficiency can be eventuated. Given resource constraints, and if equity is to be achieved between the developed & developing worlds, the new stasis will inevitably involve decentralized, co-operative, self-managing, low-impact, low-demand communities, but there need be no diminution of the quality of life.

The appropriate economic instruments must be operated against, or rather as part of, a Site Revenue economy[2], where annual rental value of sites privately occupied is collected as public revenue (in lieu of all forms of taxation). In this regard, such instruments address not only the locational values of sites but also resources extracted out of them and wastes expended into the global commons.

The Site Revenue system must be adopted globally. All rentals within the Site Revenue system should reflect market pressures on the basis that the bequest value of existing species & habitats is inestimable, that a safe minimum must be retained of all biological stocks, and that known raw resources must be rationed, at any given time, on a 1000-year plan. Whilst general rentals from locational value of sites may be paid into general revenue, rentals in respect of environmental externalities must be earmarked for expenditure specifically related to those impacts.

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[1] Significantly, the words "economy" and "ecology" both derive from the Greek *oikos* meaning household.

#2. NEOCLASSICAL ECONOMICS AND THE ENVIRONMENT

#2(a) Neoclassical Economics

(i) Overview

The standard neoclassical model of an economy is an abstract, “blackboard” theory, which bears little relationship to the real world economy. It envisages a self-perpetuating, "closed circuit" where boundless, free resources are endlessly converted by labour into goods & services and finally become resources again. Consumer prices are seen as having a natural stability reflecting resource availability & extraction costs, production costs and demand.

As a result of viewing the environment as a boundless, common-property resource with zero price, goods in neoclassical economies were produced with high pollution externalities and sold unrealistically cheaply, thereby stimulating over-demand & exacerbating degradation. Neoclassical markets fail to audit or account for a plethora of external impacts & incommensurate goods, whether public, private or non-human, thereby systematically undermining ethical responsibility. In their encouragement of material acquisition (*pace* the clamouring protestations of subjectivist & 'liberal' devotees), industry & the values-free "ideal" market shape & serve hedonistic & "want-regarding" motivation whereby fortuitous, shallow preferences, which indulgently disregard ideals, are easily driven by the perverted blandishments of advertising.

In fact, raw resources are neither endless nor produced, but rather are in limited supply and extracted. Moreover, extraction & transformation of them (eg using fossil fuels to supply energy) and expulsion of their final wastes both exploits and depends upon a world outside of such “closed circuit”. The real economy is in fact linear (in its prior & subsequent dependency) and dissipative in the way it uses potent materials and, having converted a fraction into human capital, expels the vast bulk as useless, low-grade heat or toxins by the remorseless process of entropy.

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[2] See below, section 4.

Indeed, it has been cogently argued[3] that incompetent or corrupted professors from the neoclassical & Keynesian school of economics deliberately and/or negligently attempted to pervert & debase their discipline and serve vested interests. The method used was to disguise the value of land (or sites generally) as a unique factor in production by subsuming same within the broad aggregate of 'capital' generally, and by this obfuscation of basic economic concepts to forge “mind control” over economic thinking so as to distort perspective upon, or blinker from view, the potency of locational & environmental factors. Thus did economic theorizing bifurcate from the real world and, adding to its fundamental estrangement preoccupation with the “intellectual toy” of mathematical modelling, lead to its current confusion, inutility & intellectual dead-end. The mystery of persistent economic failure is thus explained.

This extraction & consumption of raw resources, and this expulsion of wastes, may benefit industrial shareholders & consumers, but beyond that is conducted at the expense of the global commons. The raw resources involved are (recycling aside) no longer available for use by others or by future generations. The pollutants expelled not only damage species and threaten intergenerational inheritance, but impinge in various ways upon the amenity, health & materials of others.

It has now become apparent that unrestrained "cowboy" extraction of resources and waste disposal by dilution & dumping are no longer viable due to a burgeoning planetary population, the moral imperative to maintain intergenerational equity, the impact of extraction upon the biosphere and the massive quantity & potency of wastes, which, even if diluted & dissipated, resurface in ultimate overloaded sinks. Yet the neoclassical market still basically prevails such that dominant political & industrial attitudes continue to endorse both an indefinitely growing economy and private enrichment at public & environmental expense.

> "Sensible, economical conservation ... is too prosaic, and besides it violates the .... credo of preferring the most resource-using solution. Real men don't conserve resources; real men have vision and acquisitive genes, they sally forth like their warrior progenitors and grab more. Conservation is for sissies..." [4]

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[3] Gaffney, M & Harrison, F *The Corruption of Economics*, Shepheard-Walwyn (Publishers) Ltd; London 1994.

[4] "Nonpoint Pollution: Tractable Solutions to Intractable Problems" by Mason Gaffney; Paper delivered at Conference on "Political, Institutional and Fiscal Alternatives to Accelerate Nonpoint Pollution Programs," Milwaukee, December 9, 1987.

Only forthright collective action can constrain these impacts, which will be ignored by individualistic free enterprise. Such collective action must, moreover, be international in scope, since merely national constraints (eg using resource extraction charges or pollution fees) can be subverted by relocating industry offshore to regions with "comparative advantage"-- a process much assisted, the days, by the high mobility of both capital & cosmopolitan management.

(ii) Market Failure

Neoclassical economics praises efficiency, that is, production of the most (so as to satisfy all demands) at least cost. It is a concomitant of this attitude that efficiencies (i.e. aggregate benefits) may be improved but at the expense of equities (ie by causing a minority to lose). So far as human loss is concerned, it can be argued that (provided the costs of doing so are not too high), this sacrifice may be redressed by redistributing income (e.g. by giving the dole to farmers dispossessed by mining), and is not integrally a concern of law[5]. An important concept in considering "efficiency" of this type is "**Pareto**" efficiency, which exists when a situation cannot be changed to make someone better off without at the same time making another worse off.

The neoclassical ideal, efficient market fails to exist in reality, because it discounts the inarticulate & unborn, monopolies subsume competition, transaction costs intervene and informational asymmetry prevents all parties knowing all relevant factors, thereby rendering competition imperfect. Also "freeloaders" benefit from 'public goods' to which they have not contributed (eg lighthouses, defence): an unattractive proposition to private enterprise.

More particularly, for our purposes, a vast range of unpriced adverse impacts upon third-parties and the environment are ignored. Only the efficient anthropocentric allocation of an economy's ***out***put is weighed, whilst ignoring the environmental impact which the scale of the ***through***put has upon the communal environment. Modern markets, virtually ubiquitously, fail to reflect (and so "externalize") environmental impacts, whether occasioned by consumption of non-renewable resources or by unconstrained pollution. Conventional economics endorses maximization of instant throughput (ie of production, sales, turnover & profit) and has little regard to increasing efficiency whilst maintaining substance in the long-term.

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[5] See: Polinsky *An Introduction to Law and Economics*.

This failure to integrate economy & ecology renders impossible the Pareto-efficient allocation of resources: it makes some people (eg shareholders & consumers) better off but only by making others (e.g. natives, 'downstream' communities, future generations -- not to mention species) worse off. In considering any calculation of market efficiency it is essential that account be taken of the true value of raw resources extracted, natural capital harvested and pollution externalized. Any such adjustment is complicated: neat dollar values cannot be defined.

Measuring & constraining impacts is crippled by the lack of common units & methods for assessing or pricing environmental degradation, or any accepted resource accounting system. This lack leads to an underpricing of resources and of impacts with consequent burgeoning consumption & pollution. Depletion of human capital (eg by living off savings or by running down machinery with no sinking fund for its replacement) is not treated as income, but consumption of natural capital is. Rather than treating resources exported & pollution engendered as being costless givens having no downside on GNP, National Resource Accounting should be adopted to analyze & trace physical resources and so identify impacts & demands, thereby facilitating planning and reflection of externalities in national accounts.

This failure to value the environmental commons as a public good is, in reality, not so much an inherent or necessary free market failure as the construction & imposition, by treacherous academics & financiers, of a deceptive & fraudulent market.

(iii) State Failure

State failure generally (including the failure to master environmental externalities) is occasioned by inherent corruptions in democracy, pathologies in bureaucracy and perversions in the market-state interface, and by the confusions, self-interests & buck-passing which bedevil this complex politico-bureaucratic organization.

State failure is exacerbated in democracies due to its inherent structure. Politicians are elected by popular vote and tend to function from base motives[6], in their own short-term interest (of remaining in office, getting rich etc.), without regard to the global commons or to future generations. Politicians rarely have technological expertise and are exposed to capture by bureaucrats & industrial lobbies. Industry possesses detailed information but has a strong interest in constraining remedial action and in influencing or ameliorating the design of anything which must be done. Indeed, the power of such lobbies is insidious and can render conflict stillborn, thwarting its very entry into the political agenda[7] (as remains the case with the Site Revenue debate).

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[6] See eg. N. Mercuro & TP Ryan (eds), *Law, Economics and Public Policy*, JAI Press, 1984.

[7] S. Lukes, Power: *A Radical View*, Macmillan (1974), and see MA Crenson *The Un-politics of Air Pollution: A*

Politicians are thus prone, in their decision-making, to many improper (selfish or short-sighted) influences & lobbies. Such sectional pressure cripples altruistic & informed political motivation, especially where desirable reform would impact upon welfare dependents. This is especially so as regards housing, food & fuel prices, which are invariably substantially distorted since markets in such products are shaped by decades of public intervention reflecting significant political resistance against 'green' revenues which reflect 'true' environmental costs. The market-state interface has become very blurred, given state participation in the market and widespread use of private contractors (who often gain powerful leverage to define strategies).

State failure is evidenced by inappropriate laws, easy permits, lax regulation, failure to curb externalities or prosecute, secret profiteering and even active bribery & corruption: a multiplicity of costly regulations ineffectively combating symptoms rather than causes. The most viable policies[8] are not so much regulatory/removal as either structural (reducing demand, eg the need for private transportation & fuel) or preventive (eg by "clean technology" reducing raw material input and waste), but there is little will for their adoption & implementation.

Whilst vulnerability exists at State & Federal levels, the greatest dangers occur where extensive environmental responsibilities are delegated to politically-sensitive local authorities which strive for a consensus with industry. Where industry and development forces are able to (in effect) bribe politicians or councillors by "campaign donations" etc., the unfavourable interaction between the market and the state is at its most incestuous and the rout of public decency is complete.

The bureaucrats comprising government instrumentalities, like free-enterprise individuals and their political 'masters', also rationally pursue their own self-interest at the expense of ideals[9]. Thus, a hydro-electric or a municipal waste authority will tend to inflate its empire by building dams or sewerage works as if these were ends in themselves, rather than mere means. Failure to impose effective, integrated pollution control at the source (opting instead for lax licensing, dilution and end-of-pipe solutions) spawns a burgeoning & wasteful bureaucracy and extensive but largely idle treatment empires which can ultimately encourage rather than constrain production of polluting material lest costly works lie idle & appear superfluous and officials become unemployed.

Study of Non-Decision-Making in the Cities, John Hopkins Press, 1971.

8 Not endorsed until the 1987 Brundtland report *Our Common Future* by the UN World Commission for Environment and Development.

9 See W Nishanen, *Bureaucracy and Representative Government*, Aldine-Atherton, 1971.

This leads to distortion, bias and ineffectiveness in regulations since the authorities create the necessary empire (of employees, power & budget) merely on paper potentials (not in actual or effective investigations & prosecutions). Bureaucrats prefer central control and routine solutions, neither of which are sufficiently flexible to deal with the complexity of environmental externalities. Case-specific solutions (which might entail bothersome thought & initiative) are ignored and expensive solutions (which build well-paid but vapid regulatory empires) displace prevention.

Both regulatory bureaucrats and regulated industries exist symbiotically in a sphere of specialist technicality (for which wealthy industry, ever effective in lobbying, holds the relevant data) which politicians & laymen cannot enter. They talk the same jargon and each hopes to be head-hunted for plum jobs with the other: this leads to "regulatory-capture" (which is usually tacit, informal & subliminal) of bureaucrats by eco-industrial complexes. Once they are in cahoots (usually endorsing central control & routine mass solutions) specific abuses are impersonalized into anonymous, general categories. Responsibility is distanced into remote & sluggish bureaucracies and the wool is quickly pulled over public eyes.

In this way, the bureaucrat-industry cartel milks taxpayers' funds and perpetuates its own indulgences. The more industry is allowed to impact the environment unhampered, the more revenue can be squeezed -- for a few decades -- out of the artificially expanding economy, the more empires there are for bureaucrats with pretend clean-up campaigns, and the more profits for the few. The devil laughs all the way to the bank. Only disasters (such as cholera outbreaks or the hole in the ozone layer) tend to break this cartel's grip nexus (which is more the incremental result of the bureaucratic & regulatory process than a deliberate conspiracy) and refashion meaningful policies.

As a result of this state failure, for two decades industry has been allowed to mass-produce in usual or enhanced volumes, subject perhaps to dilution & end-of-pipe regulations & subsidies which have been a boon to bureaucratic empires, done nothing to constrain the mounting quantum of externalities, and (by displacement) has created new problems. These problems are essentially iatrogenic (doctor-induced) and multiply the problem, not least because repairing activity is more expensive (for the state) than prevention and increases dependence on taxation of growth industry.

#2(b) The Tragedy of the Commons

(i) Overview

> Imagine yourself as a herdsman in the Sahel at a time when the total population of herd animals has just reached the carrying capacity of the land. Suppose you have a chance to acquire ten more animals. Suppose also that you are in complete possession of the facts -- that you understand carrying capacity and the dangers of transgressing it. Should you, or should you not, add ten more animals to your herd?
>
> Since the additional animals are... ten more than the carrying capacity, all your animals will have a little less food per capita next year than this. So will everyone else's animals. So will every other country. Even so, you expect a net gain from the acquisition, for this reason: the gain is all yours, but the loss (from transgressing the carrying capacity) is shared among all the herdsmen. Your share of the loss is only a small fraction of the total. Balancing your gain against your loss you decide to take on ten more animals. In economics this is called a rational decision. To behave otherwise would be to behave irrationally--in the short run.
>
> Every other herdsman in a commons must, if rational, reach the same decision -- not only this year but in every succeeding year. In the long run this kind of behavior produces disaster for all, as overgrazing turns semidesert into desert. Even if you understand completely the disastrous consequences of living by the rules of the commons, you are unable to behave otherwise. The rules pay you to do the wrong thing.
>
> As a good citizen you might refuse to add to your herd, but what makes you think every other herdsman would also be a good citizen? If even one participant in the commons should act in a "selfish" (read, "rational") way, your restraint would go for nought. As selfish and rational exploiters appear at the expense of the public-spirited, envy will cause some of the latter to join the "rational" decision makers in their ruinous behavior.
>
> What might begin as the selfish rationalism of a few, ends in the corruption of the many.[10]

The land, rivers, oceans, atmosphere, climate, and all natural species inhabiting them were not made by humanity yet are, basically, a common good freely available to all and hence a “commons”. However, freedom rationally to pursue self-interest by exploiting a commons brings ruin to all[11], and this remains true whether that commons be local grassland or the ecosphere.

For millennia all work was performed by people & animals eating food energized by the sun, but for the last century over 90% of work has been performed by energy derived from limited stockpiles of fossil fuels containing millions of years of accumulated photosynthesis. For a time, say as late as 1950 (aside from localized tragedies), there may have been some justification for a general sense that basic resources were endless and that natural systems would cleanse wastes. Against this background, the “cowboy” ethos of allowing finders to keep resources (subject to a few extraction costs & royalties) and encouraging the mere dilution & dissipation of pollutants (eg via ocean outfall, high smoke-stack or toxic dump) seemed a fair enough way to go. [Incidentally, it should be noted that the resultant pattern has set up an expectation of rights to extract or pollute which have no acceptable basis].

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[10] Garrett Hardin *Filters Against Folly* New York: Penguin Books. 1985. pp. 92-93.

[11] See the influential essay by Garrett Hardin 'The Tragedy of the Commons' in *Science* 162:1, 1243-8

Exploitation of renewable biological resources (such as forests & fish) exceeds natural replacement of the stock and is eroding basic capital. The result has been mounting loss of vegetation, erosion of topsoil, species extinction etc. This loss diminishes not only the beauty & complexity of the planet but even the food supply and social harmony of humanity. Environmental goods (such as clean air & water) are scarce commodities which are widely valued but which have for centuries been used and abused by individuals and industry generally for private gain, often to the disadvantage of those at remote locations. The social costs of such use must be covered by the social benefits.

Technological improvement & potency, together with swelling population, are spawning far-reaching global environmental impacts from pollution, resulting in rapid degradation of the ecosphere. Specific areas of impact include greenhouse gas emission, stratospheric ozone depletion, toxicity build-up in dumps, pollution of coastal waters, etc. Apparent advances in agricultural productivity (based on broadscale mechanized farming, fertilizers & agriculture) in fact is accompanied by excessive clearing of vegetation, the acidification erosion & salination of soil (leading to deforestation & desertification), loss of biodiversity & eutrophication of surface water.[12] Natural ecosystems are amazingly varied & resilient but biospherical impacts & stresses may be complicated & diverse. Often a combination of factors (eg acid rain, discharge toxicity, soil compaction, salination etc.), create a chronic predisposition which an inciting factor (eg drought, frost or mechanical injury) may tip over the edge. Whilst local environmental decline has occurred over the millennia, only now is pollution of air, water & land becoming so universal as to affect the vast bulk of people and diminish profitability of major industries (eg tourism & fishery)[13].

Without constraints, an individual's cost of purifying waste will always exceed that of dumping it in the commons. Realizing this, many environmentalists placed general faith in government intervention and indeed perceived communistic planned economies as having a systemic advantage over free economies as regards collection of information and application of constraints. The crumbling of communism has disclosed massive environmental abuse (eg in the ocean-dumping of nuclear wastes and the diversion of waters feeding the Aral sea) and revealed how misplaced was this latter belief. Indeed, that general faith too is now withering as failure persists to tackle pollution at source. Certainly there has been increased governmental intervention, but it has been limited to mere dilution, which does not constrain production of pollutants *per se*.

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[12] See generally, *David Suzuki,* Time to Change *Stoddart, 1993*

[13] See generally David Mercer *"A Question of Balance": Natural Resources Conflict Issues in Australia* The

Whilst most people in industrialized countries (comprising 20% of earth's population but consuming 80% of its wealth) tend to dismiss these impacts as remote and concern with them as alarmism, and whilst politicians & economists in 'advanced' countries have as yet done little to come to grips with the issues, the fact is that severe indicators exist and it is foolish to ignore their warning.

(ii) Decimation of Raw Resources & Biological Capital

It takes about 1 ha of agricultural land to feed one person in a rich country[14], but such land (which is diminishing through erosion) comprises only about 1.5 billion hectares of the 13 billion hectares on Earth, placing an absolute cap on the population sustainable. The average *per capita* annual consumption of biological resources in the rich world is 15-20 times that on the poorest half of the world's people. Approximately 40% of all non-oceanic plant & animal life is harvested by humans[15], yet catch rates are diminishing (there is evidence core biological stocks are being consumed)[16], the bulk of the industrializing world is at present only partially impacting and our population may well double. This bodes ill for global peace.

Extensive academic studies[17] over the past decade, whilst largely ignored in government policy, solidly establish that at present 20% of the earth's population (at present 8 billion, projected by 2065 at 11 billion), being able to bid in hard cash (and by their continued consumption to continue doing so), consume 80% of its natural capital. The production thereby engendered is usually unsuitable for the needs & budgets of the world's poorest half.

As regards exploitable reserves of mineralized ore (both known & likely), if 11 billion people were to consume them at current rates they would be totally exhausted within 30-40 years[18]. Technical advance cannot solve these problems, and seabed deposits might in general double quantities as regards only a few items (eg copper & manganese). The cost of extracting minerals (presently 560 litres of oil p.a. per American)[19] is also rising.

Federation Press, 1991

14 Rees, W.R. "Appropriated carrying capacity: What urban economics leaves out", Environment and Urbanization, October 1992 p.125.

15 Daly, H. & Cobb, J. *For the Common Good*, Greenprint, London (1989), p. 143

16 Brown, op. cit.

17 EG In Context Institute, *Ecovillage and Sustainable Communities*, Seattle (1991); Trainer, F.E. *Abandon Affluence!* Zed, London, 1985; *Developed to Death* (Greenprint, London, 1989); *Towards a Sustainable Economy* (Envirobooks, Sydney, 1995); *The Conserver Society: Alternatives for Sustainability* (Zed Books, London, 1995).

18 UN Department of International and Economic Affairs, 1992.

19 Chapman, P.F. & Roberts, F; *Metal Resources and Energy*, Butterworths, London, 1983.

Yet estimates of world oil supply indicate a serious situation where production may peak about 2000 and dwindle to 1/3 by 2025[20]: gas reserves are roughly equivalent. Broadscale nuclear energy appears unlikely due to massive construction costs and accident & waste problems, whilst nuclear fusion is far from perfected and may be quite limited due to shortage of lithium[21]. Natural energy sources (wind, solar, tidal, hot rock) have decent potential, especially if constructed whilst existing metals & fossil fuels are available, but encounter expensive & wasteful storage problems and cannot sustain anything like current regular consumption of energy from fossil fuel. To obtain energy from coal, especially the sulfurous brown coal of China, would exacerbate the Greenhouse effect. To prevent the carbon content of the atmosphere increasing any further fossil fuel use must be reduced by 60-80%[22]: if this were done immediately, each person in a rich country would receive only 1/18 of present consumption.

It is quite impossible that all the world's population could attain the material wealth currently enjoyed by advanced nations. "Sustained economic growth is not possible because human activity already fills the available ecological space".[23] Dominant "advanced" patterns of lifestyle & consumption are unsustainable: fundamental changes and major reductions in resource use must be confronted. There need be no, or little, reduction in quality of life is that transition is planned wisely and done in good time. Yet, far from reining in growth, world economies are pursuing it: at 4% pa growth sixteen times as much will be produced in 70 years. Such multiples are manifestly absurd, and cannot be achieved by promoting the service sector (much of which is dependent upon electricity, tourism & travel). In any event, economic growth increases inequality & polarization: the economy is driven by greed for profit & market share, not by need, and it is a delusion that growth actually improves experienced quality of life[24].

> "There are strong grounds for concluding that present levels of resource use and environmental impact are totally unsustainable, yet we are committed to an economic system which will seek to multiply them many times in coming decades, without limit. It is difficult to understand the mental functioning which enables almost all economists and politicians to proceed as if there is no need whatsoever even to consider possible limits to growth. … "[25]

Our economic theory takes into account only monetary values. It is therefore incapable of dealing

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20 Ivanhoe, 1995.
21 Trainer, F.E. *Abandon Affluence!* Zed, London, 1985 Chap.5.
22 Brown, L.R. *The State of the World*, Worldwatch Institute, London (1990), p.24
23 Korten, D. *Getting to the Twenty-First Century*, Earth Island, London (1992) p. 97
24 See Douthwaite, R. *The Growth Illusion* (Green Books, Devon, 1992).
25 Dr. F. E. Trainer, Paper delivered at Australians for an Ecologically Sustainable Population conference, Coolangatta (Australia) July 1996.

with the most important values & costs the real economy involves, such as the value of species, ecosystems, communities, peace of mind, security etc., or the cost of the anxiety, stress and depression inflicted on workers, unemployed and poor people, or the cost of the noise an airport or highway imposes. Whilst conventional economics praises maximum consumption and "sufficiency" is irrelevant, perhaps[26] we should be more concerned with optimum patterns. "To define sufficiency one must ask 'sufficient for what?' The answer is 'sufficient for the good life.' "[27]

(iii) Atmospheric Pollution[28]

The massive, rapid & unprecedented emission of "greenhouse" gasses blanketing the Earth's atmosphere since the Industrial Revolution has raised average planetary temperature by some 0.5°C in the past century and is likely, upon current best estimates, to raise planetary temperature by 0.5°C per decade, effecting unknown climatic, rainfall & disease changes. "Greenhouse" gasses include CO_2 from the burning of fossil fuels for energy & transportation, methane (CH_4), CFCs from refrigerants & NO_2 from fertilizers & nylon manufacture. By swelling the upper layers of the ocean & melting ice the Greenhouse effect is likely to raise sea-level some 20 ± 10 cm by 2030 and some 65 ± 35 cm by 2010[29]. Changes in sea temperature can destroy fish-stocks (eg collapse of the herring stock in the English Channel when sea temperature dropped by 0.5°C during the 1930s).

Ozone in the stratosphere is formed by the impact of light upon oxygen molecules and protects the Earth from ultraviolet radiation. Man-made "inert" chlorofluorocarbon ["CFC"] gasses (much used as refrigerants until recently) in the stratosphere are ionized by solar ultraviolet radiation to free chlorine ions, which scavenge free ozone by catalytic reaction, allowing ultraviolet rays through to the planetary surface where is can cause cancers and inhibit photosynthesis, especially in phytoplankton which is so vital as the base of the oceanic food chain[30]. Other pollutants (eg sulphur) have short atmospheric residence and fall out as a deposit or acid rain within the immediate locality or directly down-wind.

(iv) Australian Economy

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[26] With E.,F. Schumacher, "Buddhist Economics" in his *Small is Beautiful: Economics as if People Mattered* (New York: Harper & Row,1973), pp. 50-58.

[27] Herman Daly, "The Ecological and Moral Necessity for Limiting Economic Growth," paper delivered at the Conference on Faith, Science, and the Future, Cambridge, MA (July 12-24) (Geneva, Switzerland: World Council of Churches, 1979), p.7.

[28] For more on this aspect, regarding carbon sequestration, see below ??

[29] "Grappling with Greenhouse", National Greenhouse Advisory Committee, Department of Arts, Sport, Environment & Territories, 1992, vii

[30] Jonathon Weiner *The Next One Hundred Years,* (Bantam 1990, 1991) p.158.

At present the mining & agricultural industries in Australia are exporting some $40 bn and $20 bn worth of Australian natural wealth per annum. In many ways the agricultural industry is also a miner -- of topsoil (which is lost via erosion from hard-hoofed animals or as minerals in grains & meat) and of vegetation. Adding to this $60 bn income some $22 bn from manufactures, $14 bn from inbound tourism and some $4 bn from investments gives Australia its total foreign income of $100 bn per annum, which total is $20 bn short of our foreign expenditure at $120 bn per annum (being $85 bn on goods, $20 bn interest repayment on $250 bn debt, and $15 bn external tourism).

Clearly modern Australia is "selling off the farm", plundering the trust fund which belongs to future generations, in order to "pay" for its consumption of consumer goods. This plundering involves not only loss of natural capital but also extensive environmental & expense. The massive wealth being generated by this exploitation of natural capital, is being squandered upon imported consumer goods, with little being invested into our own manufacturing infrastructure. Indeed, to have a booming manufacturing sector would strengthen the Australian dollar, making our exported minerals less competitive.

This is the motivation underlying political & bureaucratic kowtowing to vested interests as reflected in reluctance to capture the locational value of sites (thereby fostering speculation in them and diversion of investment from productive enterprise) and the delay in enabling establishment of an Over-The-Counter sharemarket (which would enable funding of small-to-medium enterprises). It also explains the excessive destruction of protective tariff barriers: whilst exposure of native industry to competition is healthy in principle (so as to avoid protecting mollycoddled industries with flabby managers & greedy unions), the exposure of competent home industries to foreign competitors enjoying unequal advantage (eg in exploitative labour laws or in liberties to degrade environment), whilst keeping our currency weak and serving mining interests in the short term, destroys vital home industries & skills and is counter to long term national interest. Of course, any local tariff's collected to balance unfair conditions in exporting countries should be applied -- regardless of national boundaries & jurisdictions -- only to remediate such unfair conditions.

#2(c) Incommensurate Goods

(i) Overview

Incommensurate goods are attributes of reality which cannot be valued by the market. They include existence values, bequest values and such valuable "Aristotelian"[31] intangibles as friendship, health & sanity. Incommensurate goods tend to be ignored in the neoclassical marketplace, and to the extent that it ascribes value to them, it does so arbitrarily & invalidly.

(ii) Existence Values

[31] See Aristotle's *Nichomachean Ethics*

"Existence value" is the value attributable to the existence of a species quite apart from humanity. Metaphysically, it is arguable that flora, fauna, biosystems and even geographical features & places [all hereinafter severally & jointly termed "**natural entities**"] have objective intrinsic values, which exist apart from human ends & evaluation. The anthropocentrist (with ontological extravagance) argues in reply that humanity is the ultimate measure of all value & source of evaluation, so value cannot exist without humanity. Both positions are unsubstantiated emotional assertions: whether values can or cannot exist without the "perceptions" of human evaluators, they may nevertheless ultimately have (or not have) humanity as their sole object. The real debate about values is essentially biological, ethical and even economic (in a long-term, practical sense), not metaphysical.

Biologically, natural entities can flourish or decline quite irrespective of humanity. Sometimes a halt to the flourishing of a species (eg decimation of an ant colony) is essential to its survival, or the death of an individual creature (eg an earthworm) is essential to the flourishing of another (eg a kookaburra). Clearly, at a biological level, independent of humanity, individual natural entities have their own goods, as do collectives of them; so do ecosystems, independently of their constituent parts. Moral imperatives do not necessarily follow for humanity from recognizing natural entities as biological goods: we may remain indifferent or antagonistic to the good of cockroaches or the HIV virus.

Under broad anthropocentric valuation, the flourishing of specific natural entities may range from "good" for instrumental (ie exploitation) reasons (eg oceanic fish stocks), through "good" *despite* their non-exploitation (eg black cockatoos) -- or indeed *because* of same (eg unspoilt wilderness) -- to "bad" (eg funnel web spiders). How far can we legitimately take this? We cannot adopt a simple utilitarian approach and endorse extensive or blanket destruction of some things (eg bushland or even rainforests), so that our suburbs can profitably sprawl and our Parliament House be nicely lined, on the basis that this serves "the greatest good of the greatest number". To do so involves an impossible cross-species ascription & calculus of values, and is akin to endorsing the hedonist utilitarian who legitimizes the pleasures of the sadist & child molester.

Objective environmental goods (eg clean air & water, natural vistas, silence free of raucous engines, biodiversity, resource availability, healthy pollution sinks) are essential to Aristotelian well-being. It is possible to accommodate such "existence" values into human calculations, but the difficulty is quantifying them independently of subjective human evaluation. No doubt some reflection of value for incommensurate goods appears in the price of commodities or sites, but the precise quantum of that reflection is difficult to comb out, and is perforce merely partial: such goods have inherent worth and this is not to be equated with the price of icecream. What is the dollar value of a viable fragment of remnant bushland in a sea of suburbs, of a sustainable koala population, of retaining the species humpback whale, of the last stands of wispy vulnerable casuarina scrub upon which depends the black cockatoo?

Ultimately, the best case for an environmental ethic must proceed on Aristotelian lines: valuing

natural entities for their own sake is good because doing so deepens & defines our humanity and is constitutive for our own flourishing. Aristotelian well-being shuns mere "want-regarding" preference satisfaction as shallow "supermarket" motivation, an ignorant & indulgent pandering to uninformed desire. It is "perfectionist", aiming at informed definition of the "good life" by requiring recognition & satisfaction of "intrinsic" ideal principles & values, transformed by education & experience beyond the narrowly utilitarian & commercial, having inherent worth & transcending monetary price. Such principles are truth, virtue, health, sanity and friendship, because these "answer to good & competent evidence" and striving for them cultivates that detached perspective which is the essence of being human[32].

It is quite irrational to crave a debauched world or a "saucer of mud"[33]. The conclusion is inescapable that economics cannot properly constrict its discipline and the intrinsically-valuable non-human world to market satisfaction of ecologically-malignant anthropocentric demands or financial profit *now*, at the expense of long-term public health, future generations & other species. Natural entities & resources are not extrinsic instruments created for human indulgence.

(iii) Bequest Values: Intergenerational Equity[34]

Intergenerational equity is concerned with the moral imperatives of what sort of world we hand on to our children & grandchildren. We are indebted to our forebears for the physical infrastructure they constructed, the knowledge they developed & channeled and the institutions they forged, and we depend upon future generations to develop our initiatives and to appreciate our achievements. Our identity spreads over time: despite ongoing arguments about weighting of values, we have an obligation to ensure intergenerational coherence in a joint community.

In modern times, fragmentation of decentralized community life (identified with place, kin & occupation) due to specialization & high mobility (in land-ownership, labour & residence), together with intense economic pressures, the impersonality of corporatization and hedonism, have bred uncertainty and sacrificed that natural intergenerational concern which characterized traditional families. The modern individual or family is far more likely to focus on a temporally local horizon, constrict obligation to instant kin & community (who can benefit or harm us) and myopically exploit the global commons for personal gain.
The perception that "we can freely harm future generations since they cannot harm us" diminishes

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[32] See John Finnis *Natural Law and Natural Rights* (1980).
[33] See G.E.M. Anscombe, *Intention* (2nd. Ed, 19630 pp. 70-72.
[34] Defined & endorsed by the Australian Inter-Governmental Agreement on the Environment (1992):.
3.5.2 intergenerational equity - "the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations".

the pertinence of a proud & worthy reputation (which cannot exist in subjective delusion and can only be objectively formed by subsequent peer group judgment) and involves a debilitating loss of historical perspective on the evolution of humanity. It also entails the dangerous assumption that death terminates consciousness, rather than liberates it from the body, and that Creation (despite having manifested freewill entities in order to forge an infinite comprehension of itself) will involve no objective judgment upon individual acts & attitudes, however damaging.

At present, in our market-dominated economy, the worth of goods & activities is measured by an unethical & irrational "cost-benefit analysis" which discounts future impacts and those upon the global commons, and attributes dominant value to satisfying "actual" (ie temporal and often shallowly materialist, rather than “informed”) human desires. Such cost-benefit analysis is anthropocentric & short-sighted, failing to address intergenerational equity and the unarticulated, intrinsic, non-instrumental "existence" needs of non-human entities.

To some extent, the interests of future generations may be vicariously reflected in the concerns of those now alive (e.g. of parents for their grandchildren), however such reflection is precarious and (due to prevalence of egoistic preferences) inadequate. Humanity has a general moral obligation to conserve viable tracts & colonies of all kinds of existing habitats & species, together with assured availability of known exploitable resources: these have an inestimable (not just a minimum) bequest value.

(iv) Health & Sanity

The health, sanity & balance of individuals is incommensurable in value. Whilst the course of an illness may be valued, in some sense, by aggregating the cost of medical care, prescriptions, loss of earnings, pain & suffering etc., ultimately what has been lost is beyond pricing. To the extent that a polluted, toxic or even just ugly & blighted environment causes or conduces to that anomie & spiritual ennui common in industrialized societies, depression, ill-health or even death, the costs -- whilst largely ignored by neoclassical economists -- rapidly become simply incalculable.

(v) Private Ownership of Natural Resources

Traditionally the common law attitude has been that, as regards the commons (as distinct from private land) each person has an unlimited personal right to extract, mine, hunt, catch or pollute as much as that person pleases. This attitude ignores both external costs (ie on others "downstream") and existence rights of species per se, and leads both to over-exploitation of resources and the over-development of environmentally-valuable land held in private ownership. Monopolistic rights may foster a false restraint in exploitation so as to preserve longevity of the resource and maximize scarcity value.

Raw resources, both non-renewable (eg ores) and renewable (eg timber & wild fish, were bestowed by Creation, not made by humanity, and must be treated as common goods (at most). There is no moral basis (especially given intergenerational perspective) for one person claiming ownership of them, even is s/he did "get there first" or pay a "vendor" money for the "rights", and this remains so whatever may be the assertions of a domestic law.

Traditionally, at most, royalties have been charged by states for regular commercial logging or extraction, since supply of these resources is seen as a public good (generating employment & profits). Such royalties have tended to be relatively nominal (just to assist with management costs), and are not rationally priced on a market basis. In no instance (except perhaps at that of the single, manually-labouring man at the margin), given the potency of human co-operation & mechanized equipment, can the unregulated private extraction of resources be permitted to continue.

#2(d) Modern Neoclassicists

(i) Pigou, Coase & Boulding

During the 1920s, the English economist Pigou (oppressed by the mounting urban smog of central London) originated the simple but visionary concept of externality taxation as being essential for market equilibrium. His intent was to enable an equivalence between private profit and the net social product. Pigou was also concerned with the waste (for trivial purposes) of natural product currently but not permanently abundant[35]. Although he neither specified methods for calculating the tax nor earmarking its expenditure, it seems to be implied that the tax would equal the damage and be applied to remedy it: in theory, this would lead to an optimal stasis. However, he saw externality taxes as being not so much reparations for "damage" as a pragmatic fund to be earmarked for constraining, abating & repairing abuses of the externalities involved, e.g. by maintenance of public cleansing facilities (such as tertiary sewage works or forests) and by public research into & development of cheap & unpatented solutions[36]. His ideas gathered little headway during the comparative resource abundance & limited pollution at that time, swiftly followed by Depression & World War, and did not begin to enjoy policy implementation until the 1970s.

During the 1960s Ronald Coase criticized the failure, post-Pigou, of theoretical environmental economics to weigh the real-market transaction costs inevitably arising from environmental pollution, and the extensive costly frictions inherent in the (hugely complex & fragmented) political & institutional constraints & tensions bedevilling this problem. These monstrous constraints, and all the variables concatenating them, are traditionally ignored by simplistic, neoclassical "blackboard" economists.
Coase assumed that externality taxation or state regulation would be so costly as to be unjustifiable

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35 Pigou, A.C. *The Economics of Welfare*, (1920) 1932 ed. Macmillan, London p.28

36 See Pigou, AC *The Economics of Welfare* op. cit.; and *A Study in Public Finance* (1928).

and endorsed a laissez-faire approach. He asserted[37] that if private property rights were better defined (in effect, by privatizing the environment, giving each citizen a right to clean air, no industrial fallout etc.), then externalizers would compensate those affected (under threat of civil liability), or those affected would buy off the externalizers. Coase thus envisaged granting or auctioning tradable permits to established industries, by way of "offset rights" to compensate for new restrictions. Incidentally, a side-effect of this was to thereby enable:

> "ancient and honorable polluters … to grow rich by establishing their respective histories of pollution which they can now sell to others who wish to continue this wholesome tradition. Those needing air to breathe? Well, according to the modern philosophers they can enter the market, buy up offset rights and retire them"[38].

Upon this basis -- assuming zero transaction costs -- an identically efficient outcome would eventuate in either instance, regardless of whether industry has a right to pollute or citizens have a right to a clean environment. If insertion of a stack scrubber is the most efficient way to curtail loss then it will be inserted, in the first instance by affected citizens and in the second by the factory. Of course, the party who bears the expenditure (irrelevant from the point of view of aggregate efficiency) is a matter for the law. However, zero transaction costs are impossible, since it is bothersome & time-consuming for affected citizens to identify each other and decide what to do, then & execute that decision. Coase recognized this, and concluded that the preferred legal rule is the one which minimizes transaction costs.

Coase's attempt to buttress neoclassical economics by painting environmental externalities as essentially private property concerns, is bound to failure. Whilst his emphasis on recognizing transaction costs is valuable, Coase is basically fallacious & flawed since he errs in seeing externality taxation as a method of compensating those affected rather than constraining the externalizers -- or better still, neutralizing their externalities. Ironically, he fails to perceive that complicated transaction costs will be minimized or avoided if there is no right to pollute, for then the onus of finding a solution falls upon a few polluters rather than a multitude of citizens. Moreover, payment of compensation to affected parties would involve further inefficiencies, such as complex & dubious methods of assessment and attraction of "gold-digging" plaintiffs. It is simply impossible to assess the dollar-value of impacts or even (in the case of diffused pollution) to locate, weigh & attribute externalities. Nor are environmental goods "open access" property so much as common (or state) property. Going even further, to ascribe "private rights" in it -- a concept very alien to existing laws -- creates terrible distributional & intergenerational conflicts (whereby the present private "proprietors" of (say) a river's purity may "sell it down the drain" and relocate themselves. Coase ignores intergenerational & existence rights.

During the 1970s Kenneth Boulding[39] questioned whether human welfare (which economics

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37 See Ronald H. Coase 'The Problem of Social Cost' in 3 J.L. & Econ. 1 (1960).

38 Gaffney, op. cit.

39 Kenneth Boulding, "The Economics of the Coming Spaceship Earth," *Environmental Quality in a Growing Economy (Resources for the Future)* Washington, DC: Johns Hopkins University Press, 1966.

ostensibly serves) was a state or a process, a stock or flow. His thrust was that human welfare is a stock and that therefore consumption of non-renewable raw resources and irreversible pollution of environment, whilst they might temporarily add a few goods to the marketplace and enrich a few producers, overall & permanently diminished that stock. Given the increasing magnitude of the impacts upon a fragile, limited "spaceship" Earth, a "cowboy" mentality of grabbing what you could for yourself whilst you could (regardless of nett welfare) was inappropriate. Only by adoption of National Resource Accounting, reflecting resource extraction and externality impacts, could anything approaching an accurate GNP be defined.

(ii) Cost Benefit Analyses

Rearguard neoclassical economists persist in granting blank cheques for over-exploitation, and argue that opposition to "want-regarding" indulgence is somehow illiberal or totalitarian, lacking neutrality amongst plural conceptions of "good", or that the moral duty of this generation is only to hand the next a certain standard of living and not to necessarily preserve biological stocks[40], or that technology & human inventiveness will overcome all shortfalls.

In fact, only environmental capital is autonomous in its extended existence, and all human & man-made capital depends upon it.

Modern neoclassical economics regards proposals for taxes on environmental externalities as a price which reflects the "damage" caused and, as such, will constrain excessive production & consumption until an optimum balance is struck[41]. They also purport to be able to compute the macro-economic effects of policy *changes* (e.g. implementation of pollution & resource rentals) by modelling, thereby foretelling what cessation of demand, unemployment etc. to expect. If this rearguard is correct, then a scientific, mathematical method is at hand whereby appropriate fees, charges, taxes etc. can be assessed so as to redress the Pareto inefficiencies foisted upon others by the environmental externalities of the traditional neoclassical market. They propound extraordinarily varied & complicated formulae[42] purportedly enabling the valuation of environmental assets (vistas, ore deposits etc.) & externalities (from pollution etc).[43]

There has never been a problem is assessing the dollar value of <u>direct</u> costs of environmental degradation. Thus a relatively clear dollar value can be determined for rebuilding a marble wall

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[40] Solow, R.M. 'On the Intergenerational Allocation of Natural Resources' JEnv.Ecs.Man. 4, pp 1-24 (1986).

[41] F. Archibugi & P. Nijkamp *Economy and Ecology: Towards Sustainable Development*, Kluwer Academic Publishers, 1989

[42] See eg H. Folmer & E. van Ierland, *Valuation Methods and Policy Making in Environmental Economics,* Elsevier 1989.

[43] See section 3(f) below

eroded by acidic exhausts; paying for medical fees, pharmaceuticals & loss of earnings occasioned by ill-health; the reduced value of a blighted site; relocation expenses etc. Unfortunately, however, things are not that simple: these outlays are only one sliver or reflection of the impacts, and other fractions (such as the aesthetic or antiquity value of the ancient wall, or the true human cost of the ill-health & loss of home) are incommensurable.

Calculating a value for the myriad ramifications of environmental externalities, so as to quantify & provide a balancing control mechanism, can rapidly become a hugely complex exercise. The cost benefits to be analyzed are both macro-economic (eg fossil fuel pollution may have costs, but it brings wide benefits eg in transport systems) and social-disequilibrium (e.g. in the personal ramifications of poor health & oppressive aesthetics, such as manifest in depression, anomie, vandalism or criminality). Even then, were an economist, with tremendous diligence & transaction costs, to somehow explore & weigh all of this intricate, endless maze, Aristotelian, existence & bequest values (which are impossible to assess empirically), would remain ignored. Disregarding the benefits of earmarking, and envisaging payment of proceeds into general revenue, exacerbates the deficiencies.

Economics has not developed a method of ascertaining the worth of environmental assets taking into account their actual or potential use value, aversion to losing same ["option value"], and ascription of bequest value[44]: even then, the impossible moral problem of anthropocentrically asserting (or denying) some existence value remains. Some neoclassical rearguard even deem it feasible to value intergenerational resources, as if some lump-sum could be calculated (by aggregating some individuals' monetary assertions) & paid now for the right to decimate or destroy, say, whales or stocks of North Atlantic cod. In any economic cost-benefit analysis, it is essential to factor in the clear needs of the inarticulate, whether non-human species or unborn generations of humanity.

Whilst it is inevitable that pollution & resource charges will raise prices, alter demand and change patterns of employment, the ways & extents it will do so and the alternatives engendered in a free economy are far too complicated for any computer to analyze in advance. Only say half the relevant data can be collected & factored in, and by the time that is done same is out of date anyway. Macro-economic modelling, dealing with hugely complex & volatile scenarios and necessarily limited by inaccurate data (especially at inter-sectoral levels) & value-judgments (eg as to the worth of increased public health), are bound to be of limited utility. Indeed, to the extent that such modelling has any utility, it indicates that the nett effects of environmental policies are relatively small, since they encourage use of new & efficient machinery, incite improved efficiency of process & raw-material input and stimulate employment on new fronts[45].
Notwithstanding this, rearguard classical economists (virtuously endorsing "consumer sovereignty" as regards their "exogenous preferences") assert that <u>indirect</u> impacts can be "contingently valued"

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[44] See section r 3(h) below.
[45] OECD *The Macro-Economic Impact of Environmental Expenditure*, OECD 1985, p.10.

by aggregating how much those affected by environmental impacts (eg by bad air, dust, noise or ugly aesthetics) would be willing to pay to end the impacts (or to accept -- eg via higher wages -- for surrendering any legal rights regarding them). In this way, they say, an appropriate determination redistributing income can be made unaffected by public policy or legal rights.

However, contingent valuation is a dubious methodology, impossibly complicated and distorted by inherent biasses[46]. It is only marginally better than complete ignorance. They are flawed due to the difficulty of surveying comprehensively, the incompleteness of the information presented, the situation being hypothetical, the tendency of those polled to assert irrational random or vague figures (knowing they need not pay, or will wish to avoid doing so), confusion of different values pertaining to use of the resource (eg for recreation or personal exploitation as with fishing) and to non-use of it (eg its option, existence & bequest value), and in any event downstream distortions arising from problem-displacement. In any event, such determinations are inherently suspect as being bluntly anthropocentric (ignoring other species' preferences) & intra-temporal in the sense of ignoring intergenerational equities. All cost-benefit analysis should be regarded as an impossibly arbitrary & unethical assertion.

The conclusion has to be that all exercises of mathematical modelling which attempt to ascribe dollar values to environmental impacts, and hence to enable scientific weighing of their “cost benefit”, are void & vain. The only firm basis upon which to proceed is that environmental impacts should be nil, or if temporarily inflicted, completely remediated (via revenue instruments) as much as possible.

#2(e) The Sustainable Market

(i) The Nature of “Development”

"Development" is something of a value judgment, implying that the world is becoming better, but it takes a huge variety of forms, from opening of new mines, factories & logging coupes through urban & agricultural expansion to localized clearing. There is no necessary connection between development and either overall economic growth or environmental impact: sometimes it may be both massive and environmentally benign (eg the computer industry), or improve existing environmental impacts (eg by using new technology, as in tertiary treatment of sewerage). Nor does an increased GNP necessarily involve increased environmental impact, as post-industrial growth in the non-tourist service sector evidences. However, at this juncture of human evolution on Earth, "development" tends to rest on an industrial & mechanized basis involving resource extraction, consumption of fossil fuel and impact upon the biosphere.

Sustainable development, as endorsed by the UN’s 1987 Brundtland report[47], must meet present

[46] See below Chapter 3(f) ??

[47] World Commission on Environment and Development, Our Common Future (Oxford: Oxford University Press,

needs without compromising future needs, and so must be ecologically based. Any evolution of "sustainable development" would best involve coherent, integrated parallel improvement in economic sensitivity (to the value of externalities, reflected in raw material & finished product pricing), environmental monitoring (as to impacts, indicators & linkages), and industrial techniques (technologies, processes, waste treatment). Such parallel improvement, whilst encouraged to be voluntary, should be underpinned by law.

(ii) Low Impact, Low Demand Sustainable Lifestyle

The only long-term solution is to minimize human impact upon the environment by reducing demand and enabling it to be serviced locally. It is possible to envisage techno-structured societies (eg with permanent shelters connected with fibre-optic cabling and using solar vehicles, natural energy sources & hydroponic farming) which could eliminate vast swathes of non-point pollution, but getting or evolving to such a state is another matter.

This must involve small scale, localized, co-operative and basically self-sufficient local economies, but not "communes". The collapse of communism clearly evidences something the free, voluntary commune movement in Australia (although largely derailed & neutered by the "dope-dole" economy): individual liberty, free enterprise and grassroots-co-operative (rather than imposed-central) planning is the only viable way. Therefore, intentional communities should be structured[48] so as to combine the best of both worlds, i.e. legally securing private property & privacy whilst encouraging group sharing in appropriate, but tightly regulated, ways. Loose structuring (eg as tenancies in common, companies or co-operatives), even if an internal deed or the Articles of Association assure members of some privacy & security, are less preferable as legal structures since any privatization of land holdings amounts to an illegal subdivision[49].

A sustainable civilization can be eventuated by the broadscale "permacultural" planting of landscape (both urban & rural) with useful vegetation (supplying food & materials outside the cash economy), fostering work (especially on a part-time basis) in the vicinity of domiciles, constructing autonomous buildings (solar-oriented etc.), tapping natural energy, minimizing transportation from or travel to distant places, improving mass transportation, developing fuel-efficient & solar vehicles and co-operative bulk distribution networks, the co-operative ownership & use of major capital goods, provision of collective purification plants, district credit unions and the decentralization of government.

The collapse of communism underscores that such a civilization should remain based in the free market, with individual land tenure etc., but most probably with extensive use of community titled land (wherein home areas are owned privately and extensive commons are held for strongly defined

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1987).

[48] E.G. under the *Community Titles Act* (NSW, 1989) or the *Building Units and Group Titles Act* (Qld., 1980).

& regulated purposes). Given that much material infrastructure is already in place, such an adaptation could be effected thanks to local cultural wealth and the technological revolution (putting encyclopædic information into every home of the 'global village').

#2(f) Triangulation

There can be no focus to this debate unless humanity sees its existence in a humble & realistic perspective. Debate proving the existence of an infinite consciousness & power, possessed moreover of personality, occasioning creation is quite beyond the scope of this paper. However, for present purposes, it would be well to recognize that the magnitude, complexity, coherence & saturated intelligence of creation, such being partially reflected in humans, comes from quite beyond (and indeed spawns) both humanity and this planet & its natural environment. Whatever may be the purpose or utility (if any) of creation, the whole affair is far greater than either humanity or nature. At the risk of being simplistic & assertive, let us call that Beyond "God".

Whilst possessed of freedom of spiritual choice & action, with potency to destroy Earth's ecosphere many times over, humanity cannot exist without air, food & water, and is bound into the biospheric web. Humans are not just consumers signalling via the market in isolation: humanity, their consumption and the market depend upon, and are underpinned by, nature at every point.

The natural environment cannot be dismissed as irrelevant, or even as a mere factor in production. Given the created & dependent role of humanity, it would be dangerously arrogant to treat nature as either more or less than an entity quite co-equal with humanity and all its needs & desires. The bottom line must therefore be that the natural environment must be treated as the third point of a God-Man-Environment triangle, and the latter two entities are partners with all the fiduciary duties that entails. Both scientifically and morally, humanity has no mandate to make presumptions of right to discount at the expense of Nature, its equal partner in triangulation under God.

#3. REGULATORY CHARACTERISTICS OF THE ENVIRONMENTAL LEGAL SYSTEM

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[49] Under e.g. s. of the Local Government Act (NSW 1919) ss 4, 323, 327AA(2)., and is an offence s. 339.

#3(a) Overview

Strategies to combat environmental externalities fall into two camps, preventative and removalist. The former aim to minimize "structural" demand and, by clean technology, the impact of outputs: these are the most valid. The latter aim to dilute or neuter outputs and tend rapidly to become complex, expensive & ineffectual. Dilution policies prevailed until the early '70s when end-of-pipe technologies began to become necessary, however these have failed by far to be adequate, necessitating preventive measures.

REMOVALIST		**PREVENTATIVE**	
Dilution	**End-of-Pipe**	**Technological**	**Structural**
Sewer Networks	Sewage treatment	Water recycling	Dry processes
High stack policy	Fluid bed	Energy efficiency	Demand policy
Waste sites	Incinerator	Recycling	Packaging policy

Execution of environmental law, engaged to implement these strategies, tends to fall into three policy camps, command & control regulation ["**CCR**"], facilitation of consensus, and economic instruments for environmental purposes ["**EIEP**s"]. International practice and the debate regarding environmental policy has been immensely diverse and concerned with broad strategies & techniques of intervention (eg laissez-faire, regulation, [aggressive] command & control, [conciliatory] community-consensual, economic instrument) and has focussed very little upon analyzing comparative effectiveness let alone weighing specific instruments.

#3(b) Command & Control Regulation

CCR policies involve statutory prohibition of defined activity without formal approval, usually in the form of non-tradable licenses (of operators, processes and/or premises), which are granted upon certain regulatory criteria being met and upon payment of a fee (which usually just helps cover administration -- i.e. not as a tool to abate impacts). Administrative instruments comprise permits, mandatory or optional guidelines (eg on technology used and emission volumes & standards), planning conditions & covenants. If a successful prosecution is launched in respect of a breach, fines may be substantial[50] CCR is the basis for the vast majority of environmental regulations in Australia[51].

Traditionally the common law, whilst recognizing some private rights in the environment (actionable in nuisance or negligence) did little to protect the public interest. Such protection as there is has originated in legislation, usually in the nature of CCR, and pecuniary constraints have

[50] EG on 20.11.96 Davis Gelatine was fined $50,000 plus $24,218 costs by a Brisbane Magistrates Court, following prosecution for an environmental nuisance, in respect of foul smells, extending 10 km, from its gelatine factory at Beaudesert: Gold Coast Bulletin, 21.11.96 p.10.

[51] See e.g. *Fisheries Management Act* (Cth., 1991) s.32; *Environment Protection Act* (Qld., 1994) Part 6*; Nature Conservation Act* (Qld., 1992) ss 81, 82 *Clean Waters Act* (Qld., 1971); *Environment Protection Act* (1973, Tas.), *Environment Protection Act* (W.A., 1986).

been kept at a minimum, lest industry be impeded and in the historical belief that dilution & dispersal of pollution sufficed. Even so, some retardation of economic growth has ensued from the early 1970's, substantially due to increased protection of the environment by regulations controlling emission of noxious wastes, installation of control devices and use of mandatory technology (but also partly due to lower investment & higher energy costs).

Conditions are invariably attached to the licenses, prescribing standards of technology to be employed and acceptable volume & concentration & timing of inputs or discharges. The maximum permitted emission or effluent rate (measured at point of discharge) may be scientifically geared by zoning to the ambient concentration of pollution in the airshed or catchment adjacent to the discharge. Usually any discharge within the licensed conditions is legal and attracts neither penalty nor obligation to pay. Licensed discharges aside, sometimes legislation does require the taking of all reasonable measures (which presumably involves maintenance & use of proper equipment) to minimize discharge[52].

The pollution levels stipulated or technological controls required are based upon engineering standards: thus they curb pollution regardless of cost or cost-benefit ratios and give no inspiration to private initiatives. CCR licenses tend to require specific, standardized dilution or end-of-pipe technologies and neither emphasize prevention nor distinguish between the utility of various industries. Whilst such standardized regulation may control removal policies, it is inappropriate for preventive policies, which require detailed & flexible insight into each aspect of industry. Administrative regulation will tend to issue a license permitting pollution at a specific level, without encouraging continual & specific effort to lower that level. CCR licenses often presume that local site dilution or dispersal is sufficient, and tend to ignore resultant problems downwind or downstream, in sinks belonging to another (or beyond any) jurisdiction: damage from pollution may be indirect, or occur at such distances or gradually over such time that proof of causation is difficult.

It smacks of "central planning" to promulgate regulatory constriction of emissions, even to within preset targets, since such targets are arbitrary and any setting & monitoring of performance by regulation brings a host of inefficiencies. Amongst these, and invariably comprised within a CCR scheme, are monitoring & reporting costs, employment of inspectorates, difficulty in ensuring equality, enforcement costs (especially expensive of prosecution is involved, since onerous or even criminal standards of proof may apply), proneness to corruption. etc. By collecting pollution rentals via EIEPs reflecting free market pricing all of these difficulties are overcome.

#3(c) Facilitation of Consensus

Legislation cohering consensus policies stipulate a process by which measures are regularly &

[52] See e.g. *Environment Protection Act* (W.A., 1986), s.51(b)

ethically negotiated (between bureaucrats & industry, perhaps with public input) on a case-by-case basis. In this vein may be mentioned a variety of co-operative measures such as state intervention (eg liming of acidified lakes) and demand management (eg peak rate hikes). Co-operative mutual restraint (which tends to become enshrined in custom) may be the only efficient method of environmental safeguard where the users are impoverished nomads (eg grazing vulnerable rangelands) or where thinly-spread resources are exploited (eg extraction of timber), with complicated impacts (eg canopy & habitat damage involved in cutting & snigging).

The comparative abundance of well-informed & active citizenry in a modern democracy makes it dangerous for a government to impose any policy or strategic plan without exposing the draft for public comment: failure to take this course and sincerely listen can be perceived as arrogant and excite voter backlash. Even so, it is the developers & industrialists (unlike the unpaid, volunteer public) who have the most time & money to devote to such "negotiation", and it is they who tend to have the ear of bureaucrats & politicians. Thus, indigenous governmental intervention is quite likely not only to fail to address pollution but indeed to engender it: expensive high-stack smoke dispersal may achieved glorious blue sky over urban areas, such that a myriad local voters happily return the incumbent politician, but in reality the problem is merely displaced and engenders acid rainfall elsewhere…

Sadly lacking in this modern public debate is broadscale agreement upon basic values & *données* upon which, like the "home keys" of a typist, the firm, sustainable infrastructure of a modern, viable civilization can be built. The old certainties of feudalism, empire & Bible have dissipated, the promises of Communism have proved a delusion, and even the civilizing influence of liberalism is sliding into valueless nihilism and that of socialism into bankruptcy. Site Revenue[53] alone constitutes an Archimedean point, an objective, rational, bedrock epistemological methodology, resolving this dilemma (of efficiently maximizing freedom yet retaining civilization).

Policy-making in Australia has become a slow, inefficient & convoluted process[54] (in all areas, not just environmental), largely because government has difficulty cohering rationality amongst a plurality of formative factors and obtaining necessary support amongst the prolific interest groups & self-serving professional organizations spawned by the prevalent welfare state / managed economy ethos. The resulting frustrations lead to the adoption of ever-changing policies attempting to twist & bargain amongst the impediments. Arguably, a great range of concerns in which government has

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[53] See below, Chapter 5.

[54] Marsh, I. "Politics, Policy Making & Pressure Groups: Some Suggestions for Reform in the Australian Political System.", *Australian Journal of Public Administration 42, pp. 164 - 189.*

been forced or trapped to meddle (eg personal health & housing, income support and even the status of the national economy) would look after themselves were a truly fair free enterprise system to prevail. Consequently, western democratic governments have become dependent upon (and largely held hostage to) groups, over whom the government has little control, who can manipulate public opinion, play one party off against another, or influence appearances in such critical areas as apparent capacity capably to manage inflation & employment.

The expanded role of local & state governments, the incorporation of "technical professionals" into the policy-making process, and the broadscale emergence of unprecedented altruistic interest groups (such as environmental organizations) following the social/ethical changes of the 1960's, have multiplied the complexity & tension in the lobbying web and the manufacture of new demands on government. Some of the pressure groups that have arisen have been reluctant to work within the traditional channels of influencing policy formation and have shown preference for direct action, grassroots participation and decentralization, which are inherently not amenable to central control but which have all enjoyed increasing legitimacy & viability. The resulting diverse complexities & frustrations have further fragmented, stymied & stagnated the condensation of policy and even the traditional unity of party ideology, and have increased the difficulties encountered by governments in implementing policy with support from the governed.

Ministers, Cabinet, Parliament and parties must face & comprehend the complexity & tensions of the new public choice process which has developed, and align with the cultural & structural reality of a society containing many influential and important interest groups. The establishment of a vast array of research bureaux associated with various Commonwealth departments has added to policy drift and stagnation, and these should be repositioned & rationalized to streamline policy formulation. Governmental departments must identify and identify with those interest groups which are relevant to their policy areas. Interaction with groups must be integrated with the strategic policy making process of each department. This will allow information to be shared and identify emerging issues & opinions.

Traditional liberalism sees government as the neutral enhancer & maximizer of the many competing want-regarding goods flourishing in a pluralist society. It thus purports a neutral perspective and dismisses "monist" Aristotelian values as being paternalist or totalitarian, virtuously endorsing instead the mumbo-jumbo of cost-benefit analysis as constituting a neutral process for accommodating competing pluralist desires. As unemployment, alienation & anomie flourish, as liberalism slides into amoral nihilism, we are beginning to harvest the bitter fruit of this undisciplined valuelessness.

There is a need to modify the existing policy-making machinery so as to ground the authority of the traditional political bodies. Interest groups must be encouraged to put the national interest (even if as

broadly or loosely viewed) before their own sectional concerns and to ensure that their participation in the policy-making process is clearly consistent with it. If guided by long-term rationality, the public must abandon knee-jerk resistance to green taxes, despite them having the potential to greatly raise the price of food, fuel & travel. Despite the temporary dominance of conservative politics and a materialist, developmentalist ethic, greed is not integral to human nature, any more than that humanity is destined to dominate nature or that western industrialism defines progress.

It must be accepted as rational & autonomous, and indeed essential for the viability of democracy (given the impossibility of broadscale citizenry all personally comprehending authoritative judgments & their scientific bases) politically to accept the weight of expert opinion. Current conventions & practices are inadequate to comprehend & deal with interest groups: it is essential to establish greater communication between policy analysts, advisers and lobbyists (especially peak groups), and to allow the input of information & opinions from these groups in policy formation. It is only by forging across the entire complex spectrum of interests a broad, unifying umbrella of consistent, inter-disciplinary rationality that all their thinking & motivation can be blended into a unifying national purposiveness. The deliberate avoidance & suppression, by academics, politicians and big business, for over a century now, of debate on the Site Revenue issue, is a sad reflection on the realistic viability of consensual policies.

#3(d) Economic Instruments For Environmental Purposes [“EIEPs”]

(i) Overview

EIEPs take various forms and may be imposed at various times & stages. EIEPs include emission & effluent charges levied upon end-of-pipe discharges, charges for the treatment or disposal of waste, specific product charges, royalties payable upon extraction of raw resources, specific environment taxes, tradable pollution rights, tradable resource rights, compulsory deposit/refunds, performance bonds & subsidies.

EIEPs supply incentive, stimulate R&D & promote "allocative advantage" (hence enhancing optimal Pareto-efficiency) by encouraging profit-hungry polluters, of their own volition & by innovative thinking, to focus upon how marginal may be their abatement costs, and to work diligently on constraining their externalities. This may be achieved by minimizing at-source use of raw material, employing sophisticated technology and generally constraining & internalizing pollution. Incentive is economized rather than dictated by regulation: firms are left free continuously & permanently to research & implement their own improvements (to raw material, recycling, treatment etc.) limiting pollution. The most efficient will survive and a production quota will be emplaced structurally rather than by direct regulation. The cost of externality constraint is

thus shifted from the public to the market. Far less bureaucracy is required and the emphasis moves from clean-up to prevention.

EIEPs thus force changes in retail pricing and affect demand, thereby (if wisely based) eventuating sustainable practices in a way that requires neither aggressive policing of constipated diktats nor impossibly expensive prosecution of criminal charges (often, sadly, in reactionary courts). EIEPs are consistent & automatic in their operation, and are not susceptible to momentary political whims & witch-hunts or the discretions of bureaucrats: by attacking problems at source they can redress State failure. Only by adoption & application of appropriate economic instruments is it possible to avoid central planning and State control, and to retain the free market as the sole determinant of what is produced & developed.

Whilst EIEPs may be designed as a mere, minor redistributive device only to recoup some administration & monitoring costs, this should never be the limit of their function: they have an environmental rather than fiscal motivation. The most effective EIEPs exist where a maximum harvest or assimilable discharge is set by independent scientists and the rights to quotas are auctioned annually, with all proceeds being applied to administration and thereafter earmarked for remedial works & research benefiting the relevant industry. It matters not whether the environmental impacts addressed be due to direct activity (both primary eg mining and secondary eg waste emissions) or consequential (eg via ozone-depleting substances). EIEPs should never be used simply as a device to raise funds for general revenue, even where the relevant proportion of general revenue is then spent on sundry environmental objectives. Rather, EIEPs should (from a perspective which is objective, intergenerational & non-speciesist) always attempt to balance environmental externalities by seeking to affect behaviour affecting the environment, using market forces rather CCR. Even if the base data for calculation is comparatively rough & ready, EIEPs are efficient compared to direct controls, which require inspection, testing, gathering of evidence, prosecution and thus extensive costs & lengthy delays.
EIEPs are cheaper to administer than CCR and have the benefit of flexibility & enabling industry restructuring, however EIEPs are not a complete alternative to CCR and must co-exist alongside it. Whilst the modern neo-liberal market orientation, engendered by the death of communism, increasingly endorses EIEPs, regulation remains inevitable given the complexity of rationally valuing & charging a multitude of pollutants. EIEPs may be useless, and CCRs remain essential, where environmental externalities are a small percentage of overall costs. Thus, without an overall "carbon" tax on fuels and other mobile-source pollutants (eg NO_2 & lead), only regulation can force catalytic converters & unleaded fuel. Under economic instruments alone, it may remain profitable for a firm to only remove 25% of a pollutant whereas a desirable & achievable level of removal is 50%.

Whilst CCRs tend to be more inflexible, inefficient & costly to administer than EIEPs, poorly designed or administered EIEPs are no better[55].

Economic instruments are unpopular with industry (which does not want to pay). Various types of EIEPs, eg those imposing "carbon taxes" upon fossil fuel emissions, are often claimed to be unacceptably inequitable because they would impact small, battling people who have to drive to work, operate trucks or rely upon products grown, hauled & stored using fuels. EIEPs are also unpopular with some environmentalists, who fear industry would just pay rather than clean up, or who see EIEPs as some sort of "sale" of the environment. There is a danger that the community will, in a rather shallow & reactive fashion, interpret EIEPs as creating pollution rights or selling the environment.

There is no doubt that being forced to account financially for external environmental impacts will drive up the cost of products, possibly causing major constriction in demand as the costs are passed on, and will rein in both consumption and industrialists' profits. This outcome is unavoidable if there is to be proper accounting for the true costs of production. It is irrelevant that industrialists would prefer to retain free pollution rights (perhaps under some maximum cap), or at most conform to some regulatory regime requiring adherence to specific maxima of toxicity or certain minima of annual percentage reductions. There is no time to bargain over unrequited environmental impacts, the market will have to sort out its new stasis, and the inherently-inefficient regulatory regime has no role as a core tool. No doubt substantial dislocation will be inflicted by adjustment of the unsustainable high-consumption, high-pollution lifestyle now dominant for a (mere) century in the industrialized world, but this must be faced & done to enable a sustainable planet.

Originally, "polluter pays" principles were endorsed, e.g. by the OECD in 1975, not for environmental reasons so much as to foster free trade by preventing subsidization of pollution abatement from general revenue. The 1987 Brundtland Report endorsed economic instruments as promoting cleaner technologies: indeed, this even spurs new economic growth & employment in fresh sectors. Whilst EIEPs are endorsed by IGAE[56] and Agenda 21[57], existing Australian practice[58]

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[55] See: Hufschmidt M.M. et al., *Environment, Natural Systems & Development: An Economic Valuation Guide*, John Hopkins U.P., Baltimore (1983), regarding an abortive attempt to control ambient concentrations of nitrous oxides near Chicago.

[56] E.G. from the Inter-Governmental Agreement on the Environment (1992):

> **3.2:** The parties consider that the adoption of sound environmental practices and procedures, as a basis for ecologically sustainable development, will benefit both the Australian people and environment, and the international community and environment. This requires the effective integration of economic and environmental considerations in decision-making processes, in order to improve community well-being and to benefit future generations.
>
> **3.5.4** [As a program of policy implementation] improved valuation, pricing and incentive mechanisms -
>
> * environmental factors should be included in the valuation of assets and services

is small in scope, scattered & in its infancy, with only a few innovative examples (some legislative, others administrative): they deserve much expansion if behaviour is to be influenced and externalities neutralized. The Commonwealth has extensive relevant powers, eg by special purpose grants[59], under the taxation power[60] and under the Corporations power[61].

(ii) Discharge Fees: A charge per unit of effluent/emission may be levied. Any externality should be monitored at the point of discharge: thereafter, environments have radically different absorption abilities. Charges in themselves may be arbitrary sums which go into general revenue (or into subsidy schemes) and do not necessarily either prescribe standards or stipulate a process: they simply impose a levy on discharges and leave choice of technology and quantum of output up to the polluter.

However, they may be on a flexible scale (geared to volume & content) so as to further encourage improvements (by abatement technology, etc.) or punish abuses, and when applied in this way are preferable to CCR since they involve less bureaucracy, are cheaper to operate, encourage industry to discipline itself & internalize wastes, are anticipatory and foster flexibility (as to what measures to adopt) & innovation (in the exploration of new ones). Proportional non-compliance fees are penalty payments (often on a sliding scale) payable in respect of emissions & effluents at above prescribed limits. They are economic instruments, unlike fixed penalties imposed for breaching a prescribed limit, but are difficult to monitor & enforce and, if imposed, should always be directly earmarked for expenditure upon related remedial work. It is difficult bureaucratically to set the charge at that exact rate which constrains discharge without suffocating the industry, and care must be taken lest inconsistent charges between States enable locational advantages which upset commercial competitiveness.

Queensland, New South Wales and South Australia all license emissions to air and effluent discharges, but the fees are at a fixed rate (which may, however, be tiered according to scale) and

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* polluter pays i.e. those who generate pollution and waste should bear the cost of containment, avoidance, or abatement
* the users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes
- environmental goals, having been established, should be pursued in the most cost effective way, by
- establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.

57 At the 1992 UN Earth Summit in Rio de Janiero, the world's leaders began to chart a course for the next century. They adopted Agenda 21.

58 For a 1992 analysis of EIEPs in use in Australia, see David James *Using Economic Instruments for Meeting Environmental Objectives: Australia's Experience* Department of Environment, Sport and Territories, June 1993.

59 Under section 96 of the *Constitution*

60 Which can be used even where the purpose is primarily environmental rather than revenue-raising*: Murphyores v Commonwealth* (1976) 136 CLR 1.

61 *Constitution*, s.51(xx).

are, in most instances, not load-based. Exceptions exist as regards fees, geared to impact level, as per a regulatory schedule, for various types (faecal, metallic, chemical, thermal etc.), point discharges into tidal waters in South Australia[62], and as regards the biochemical oxygen demand ["BOD"], grease, acidity, alkalinity, metallic etc. content of various classes of trade effluent discharges in Sydney[63]. At present, with the exception of these two examples (which encourage improving quality & lowering quantity of effluent), discharge fees imposed in Australia appear to have little incentive effect and just pay for administration.

(iii) Treatment Fees

Solid wastes (domestic & industrial) are usually collected by local councils as a flat rate service geared to covering collection & dumping costs: this does nothing to minimize waste, but optional or variable user charges encourage random dumping. Some councils encourage recycling, and in NSW a State subsidy is paid to councils per tonne of recycled material. In all instances, EIEPs applied as charges to neutralize or remediate externalities are an appropriate revenue instrument within the environmental system.

Brisbane's medical wastes are incinerated at high temperature by a private operator; solvents are collected & treated (@ about $350 per 100-lt. drum) and recycled via distillation. Hazardous wastes (acids, caustics, pesticides, & heavy metals) are collected by the Brisbane City Council and treated at Willawong by reduction, chemical-fixing and micro-encapsulation in antonine clay & cement, the resultant non-leachate solid being buried in double-lined, stable landfill upon State government land near Myles. Used tyres are shredded & buried in landfill pending development of useful technologies. The cost for treatment of pesticides is $6.90 per litre ($6,900 per cubic metre), and for treatment of heavy metals is $0.25 per litre. No advanced technologies are being used in Queensland[64].

Effluent wastes in Australia are also usually collected & processed by local authorities using the sewerage system. Cost structures are well established and cater for specific trade wastes (eg starch & BOD contents). In the more advanced works, tertiary treatment is effected such that the resultant product is environmentally neutral or even (as with fertilizers) actively useful. It is necessary for discharge fees to be combined with CCR (for instance, formally licensing certain trade effluents or forbidding discharge of intractable wastes).

In absolute terms, however, it is a matter for the free market whether or not relevant facilities are provided by private enterprise or (and in any event, in default thereof) collectively (eg by state government instrumentality or by local authorities). In the event that this field is opened for free

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62 *Marine Protection Act* (SA, 1990)

63 Under the Sydney Water Board's Trade Waste Policy and Management Plan.

64 Personal communication 20.11.96, Tan Trieu, (Supervizing officer, hazardous chemicals, BCC).

enterprise, to facilitate competition easements for waste disposal should be "in gross" and dedicated to that public purpose, with the owners of conduits statutorily bound to make them (or a proportion of their flow) available for rental, at a reasonable market price, by competing processors.

(iv) Environment Taxes & User Fees

Some councils & authorities (eg water boards) impose (upon households, rather like a poll-tax) special levies earmarked for precise environment enhancement programmes. Similarly, landing & takeoff charges (geared to the noise level of specific aircraft) could be imposed and applied to sound-proof affected buildings. EIEPs in the form of 'user pays' charges covering management & disposal costs exist in Australia for municipal garbage & sewerage treatment, and for trade waste disposal via the sewerage system. User fees are charged for entry to some national parks and the Great Barrier Reef area, thus being potentially an effective instrument for reducing congestion & degradation. In practice, the fees rarely cover administrative costs. Some local authorities[65] impose "green levies", applied by at about 1% of rates, for purchase of open space.

A major example is Sydney's Special Environment Levy, designed & introduced (after massive public consultation & support) in 1989 @ $80 per household, so as to raise $485m over 5 years, to meet upfront costs of new infrastructure needed to combat the pollution & eutrophication of beaches, estuaries & rivers which manifested in the late 1980s. Part of this fund was applied to monitoring, modelling & community education, but the bulk was applied to new infrastructural works which enhanced stormwater & odour control and enabled recycling (into fertilizer) of some 50% sludge, raising to 83% the level returned to beneficial use and reducing ocean outfall from 58% to 17%. James, op. cit., pp 43- 48. Those who benefit from such programmes may be "free riders" who did not pay the levy. Thus, those who live near rivers & beaches east & north of Sydney may have benefited greatly thanks to levies upon the vast bulk of households in the south & west. Free Riding would not be possible in a Site Revenue society: such an inequity would be remedied by collection of the higher site revenue accruing to the favoured localities.

(v) Product Charges

Product charges are imposed on specific products so as to curtail, or force some accounting for, their use. Such charges may often be differential (eg upon fossil fuels according to sulphur content, as in Europe, or upon new paper but not recycled paper, as in Australia). Prime candidates for such charges, given pollution of inland waters in Australia, are detergents & fertilizers, however imposition would have to be by the Commonwealth (to avoid interstate supply) and blanket imposition may impact unfairly against efficient, non-polluting operators.

Water supplied below true cost, fostering profligate use, should be paid for by consumers at a realistic price reflecting the real cost of its catchment, storage, reticulation & administration.

Frequently, in Australia, the price (domestic) water authorities charge is geared to the value of the property serviced: this may achieve a crude income redistribution, but is quite irrational. Historically, provision of cheap water has been seen by politicians as a community service obligation, and fears are held regarding the equitable effects (upon low income groups etc.) of charging full price. Such subsidies are achieved, however, at environmental cost, and full recovery on a "user pays" basis is the only simple, bedrock foundation. Recycled water (purified effluent) may be supplied for certain agricultural & recreational (eg golf course) applications.

A good Australian example regards ozone-depleting substances (CFCs, halons etc.). Under the Commonwealth legislation[66] various ozone-depleting substances are scheduled and their import, use etc. curtailed & charged at a rate per kilogram, but (in the event) the need for expensive licensing and high penalties & charge-rates was superseded by industry accepting the challenge and voluntarily using alternative products (such as HCFCs).

(vi) Tradable Pollution Rights ["TPRs"]

TPRs are founded in a belief[67] that the public has property rights in the environment, and involves the State issuing at a fixed price (or pursuant to tender), or auctioning, a fixed number of rights to pollute, up to a set level ["quotas"]. TPRs have the potential to protect environment without extensive costs. No TPRs exist in Australia except (via "grandfathering" i.e. free allocation pro *rata* to existing polluters) as regards salinity discharges to/ water diversion from the Murray/Darling rivers.

Whilst an improvement upon common law myopia, this approach can be severely defective in that **(a)** setting the quotas is relatively arbitrary, **(b)** the polluters' bids are unlikely to reflect general community preferences, or option & existence & bequest values (so the approach is inherently anthropocentric); **(c)** bureaucratic valuing of the quotas is an imprecise, "rubbery" exercise; **(d)** the community is ill-informed and apathetic, often in no position to discern & value different sources & types of pollution, and **(e)** the revenue is not necessarily ear-tagged.

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65 EG the Gold Coast City Council

66 *Ozone Protection Act (1989)*, see also *Clean Air Act (SA, 1989)*,

67 Expounded by Professor J.H. Dales in *Pollution, Property and Rights*

To found a meaningful system of TPRs, quotas should be issued only by independent authorities, upon a strictly scientific basis, in respect of specific water bodies & airsheds once their assimilative capacity is ascertained. The issue must be pursuant to annual tender or public auction and in no instance should be by way of grandfathering. Grandfathering (a common practice in the USA) sanctifies the "rights" of existing polluters, imposes an impediment to new polluters and, immediately prior to allocations, fosters maximization of pollution so as to attain a higher quota.

Auctioning quotas can go some way towards avoiding the very high costs of otherwise attempting to define & enforce property rights in the environment. Given the cap on quantum of pollution on the one hand and the polluter's need to maintain sufficient market profit on the other, the total price at which polluters bid will tend to settle at the dollar value the community places on the environment destroyed.

TPRs should be issued on a locality-specific basis and for a limited period only (say one year): they should invariably be tradable (and buy-back permitted), so as to encourage their collection by the most efficient & profitable industries, or their purchase & destruction by conservationists or the State, although the thinness of the market may swell transaction costs and distort pricing. TPRs are both effective and efficient, since polluters will maximize abatement to lower bid costs. TRRs will not work well on their own where there is no profit to be made from the *per se*. Thus, disposal of intractable wastes, such as PCBs or compounds of mercury, is not profitable as an isolated operation. This necessarily involves CCRs forbidding any disposal or storage of such wastes other than for the purpose of immediate disposal via best practice.

(vii) Tradable Resource Rights ["TRRs"]

As with waste disposal, quotas for resource extraction (eg for fishing, forestry & water) must be set by independent authorities upon a scientific basis, so as to reflect Optimum Sustainable Yield ["**OSY**"], whilst preserving 'Safe Minimum Stock' ["**SMS**"][68]. Unfortunately, given political pressures, TRRs are usually issued by grandfathering and for lengthy periods (albeit on occasion subject to centrally-imposed quotas), rather than being auctioned annually for full value. It would be

[68] See below, section 5(g)(ii).

better to "bite the bullet" and foist an initial, major one-off capital cost (in the form of TRR bidding costs) upon resource extractors and allow their recovery via the market price mechanism thereafter, despite heavy "social equity" impacts on impoverished consumers. In this connection, corporatization & privatization of government utilities (eg water & irrigation boards) may be the only way to enable realistic pricing free of political pressures. Public support for such moves can be won where proceeds are applied to manifestly effective environmental works.

TRRs effectively allow **(a)** the determination of biospherical capacity to supply raw materials wastes or biomass **(b)** public accountability for the economic value of the resource thus privatized and **(c)** economic efficiency employed in patterns of harvesting & consumption. TRRs are relatively common in Australia and relate to water extraction (from inland streams) and forestry & fishing quotas[69].

The quotas must be allotted by tender, or publicly auctioned, and entitle the holder to exploit the resource. In no instance should TRRs be donated via grandfathering: one of the most grotesque examples of this is the US practice of issuing irrigation rights drawn on rivers & aquifers at the unrequited expense of both aborigines & environment. Eventually, given free competition (and at least cost), the price bid for TRRs will reach a stasis balancing community demand for the relevant goods & employment with an objective, conservative scientific assessment of maximum sustainable impact. Presumably, so long as the auctions are held annually thereby ensuring sensitive ongoing adjustment, this equation will involve no intergenerational downside.

The proceeds of such auction (after payment of bare overheads as regards scientific studies, monitoring & enforcement) must be exclusively earmarked to ameliorating the specific impacts resulting. Thus, for instance, the surplus after administering auction & monitoring of forestry activity must be applied exclusively to reafforestation.

TRRs must remain tradable, so as to concentrate tenure in the most efficient operators & high-value industries, or State buy-back & purchase by conservationists for the purpose of deliberate non-use. However there is a need for central registration & approval of trades lest impacts concentrate unwisely in specific areas or monopolies result. Sometimes a quota is reduced by a fixed percentage upon approval of a trade, so as to gradually lessen demands on the resource and constrain "sleepers" who hold onto grandfathered rights pending a profitable speculative sale.

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[69] See ABARE *Tradable Rights for Resource Use: Individual Tradable Rights in Fisheries Management* (1993).

As regards **water rights**, at common law there was unrestricted entitlement to divert riparian flow, but with the advent of restrictive legislation[70] diversion required a license (for say 15 years) tied to specific land. The modern concept of Tradable Water Entitlements ["**TWEs**"][71] breaks this tie, enabling (subject to approval by the authority, mortgagees etc., and barring compulsory retention of a certain domestic & stock minimum) temporary or permanent transfer of entitlements. After reserving a scientific proportion for environmental sustenance, licenses (for volumes from the balance geared to land size) are allocated upon request, with payment only of an administrative fee: there is no attempt to fix & collect true market price for the resource thus privately diverted. Allocation (by virtual donation) of valuable water licenses simply on the basis of land area owned no doubt kowtows to the passé common law ethos, thus creating minimal "establishment" political waves, but (although enabling trading which promotes efficient & productive uses -- eg away from salinated areas -- [72]) in doing so largely abdicates any rational accountability for the environmental & public cost of the resource thus privately allotted. However, in some instances, new supplies of water have been publicly auctioned, reaching as much as $775 per megalitre[73].

Certain **fishing quotas** (eg for bluefin tuna, abalones, pearls) are allocated, and subsequently monitored on landing, once the total allowable catch is scientifically assessed, but allocation is on the basis of capital invested & catch history: not public auction. Problems of "high-grading" ensue, as fishermen reject smaller fish (which may fatally weaken or die) and concentrate on maximizing quality of their quota. Wildfish quotas have enabled stock regeneration and one major effect of has been to foster mariculture (fish farming).

(viii) Deposit Refunds

Deposit refunds, although once common in Australia, ceased with the advent of disposable containers, which brought public costs in littering, collection, landfill etc. Only in South Australia[74] is there express legislation imposing a substantial deposit, of 10-20 cents, upon containers. Whilst this imposes a substantial (labour) cost upon industry, it has wide public acceptance and fosters major

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70 EG *Irrigation Act (Vic., 1886)*

71 See *Water Act (Vic., 1989)*

72 It has been estimated that as much as 10% of water rights will be traded to more efficient uses, at a gain (in terms of agricultural efficiency) of $2.5m per 1%: James *op.cit* [fn 51], p.64

73 James, *op.cit* p. 64

74 Pursuant to the *Beverage Container Act (SA, 1975)*, which was substantially upheld by the High Court of Australia in *Castlemaine Tooheys v State of South Australia* (1990) 169 CLR 436, although an amendment placing differential rates of refund upon non-refillable beer bottles was struck down as being really aimed at protecting local industry against interstate competition.

incentive for collection & return, resulting in high (over 90%) glass & can recycling rates, well above levels in other states. This requirement should be adopted nationally and extended to batteries (especially car batteries), tyres and car bodies. Whilst redeemed deposits (over $1m in SA) may accrue as free working capital for brewers, there are precedents[75] for such being directed into a public trust fund for environmental rehabilitation.

(ix) Performance bonds

Performance bonds may be imposed by local or specialist approval authorities to ensure compliance with development conditions (eg as regards limits to permitted vegetation clearance, revegetation, siltation traps), under mining legislation[76] to ensure rehabilitation (thereby minimizing dust & leachate), or effluent control[77]. Bonds tend to ensure self-regulation & voluntary compliance. On the downside, such bonds can easily become inadequate, they may tend to be imposed at a flat rate without factoring in site-specific rehabilitation costs, and they can tie up developers' capital at a time it is needed most (although this may be substantially circumvented using bank guarantees or insurances).

(x) Subsidies for Non-Pollution

Subsidies are payments from general revenue which either pay polluters to cease polluting, or assist them to purchase equipment which curtails pollution.

Subsidies are very suspect as an EIEPs since **(a)** they tacitly admit a polluter's right to pollute; **(b)** they actually encourage polluting behaviour (so that the polluter can bludge more subsidy), **(c)** they shift the onus of initiative from the polluter to the public, thereby **(d)** crippling focussed motivation & lateral thinking & curtailing innovation), **(e)** they prompt over-investment and **(f)** they involve inherent legislative time-lags, and insofar as they underwrite specific sorts of existing technology, they fail to keep abreast of new advances. If case-specific outputs are strictly measured & taxed there should be no question of actively subsidizing polluters who take steps to improve output: their steps bring their own reward.

Economic instruments should never take the form of subsidies for better technology: this move

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75 EG in Michigan & Massachusetts, USA

76 EG *Mineral Resources Act (Qld, 1989)*. See also similar regulatory requirements in the *State Development and Public Works Organization Act* (Qld., 1971); *Rural Lands Protection Act* (Qld., 1985); *Water Resources Act* (Qld., 1989); *Cultural Record (Landscapes Queensland and Queensland Estate) Act*, (Qld. 1989); *Rural Fires Act (Qld, 1956)*; *Forestry Act* (Qld. 1959); *Beach Protection Act* (Qld. 1968); *Noise Abatement Act* (Qld., 1978); *Nature Conservation Act* (Qld. 1992).

77 *Marine Protection Act (SA*), s.32.

should be left to the economic choice of each industry. The instruments should simply collect the set charge per unit of resource used or pollutant emitted, without discretion for exemptions. Despite the demands of lobbyists, the consumption of gas water or electricity in bulk, land clearing, the dredging of harbours and the draining of aquifers should never be subsidized, but should only be permitted on the basis of full user pays. Bounties should, however, be payable for positive externalities, such as retention of forested landscape for visual amenity & air-scubbing.[78]

(xi) Empirical Case Studies: Actual Economic Instruments

Economic instruments (albeit comparatively insignificant & trivial) have been used to control water pollution in France & Netherlands since 1970 and in Germany since 1981. Detailed analysis & comparison of the empirical effects flowing from imposts at source on water pollution by organic (c.f. heavy metal) wastes in various European countries establishes that these tools, when under the control of politically-independent authorities, operated dynamically to actually change behaviour an foster environmental, economic & technological advances[79].

In Germany (& the USA) regulation is essentially by "command & control": it stipulates use of a certain level of technology and specifies standards for licensed volumes of organic discharge. An effluent charge is levied, but only to pay for monitoring the command system. In Denmark no effluent charge is applied. In France, independent authorities fix & collect a levy upon organic discharges, and this is earmarked towards (partial, subsidized) remedial measures (eg sewerage, dephosphoration & denitrification plants). The Netherlands is similar, save that its levies are set at a higher rate to fund a "closed system" -- ie, covering the cost of remediation and its administration, without subsidies: this eventuates in user fees being set higher. Skou concludes that reductions in discharges are markedly better in the Netherlands than in the comparison countries, especially Denmark, and that this has been achieved at less cost. By forcing industry to internally solve their pollution problems, public responsibilities & costs are reduced.

It is the countries with the greatest industrial productivity which generate both **(a)** the heaviest pollution problems and **(b)** the wealth with which to address same. National policy style and the calibre of pertinent institutions may well greatly affect "ecological modernization" [80] and environmental outcomes. Various studies[81] indicate that this is so. It is said that countries with relatively successful economic & labour market policies also tend to have relatively successful environmental policies, and Japan is cited as an example of this exemplary trend, however the

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78 See below, sections 4(e)(iii); 5(f)(ii).

79 See Mikael Skou Andersen *Governance by Green Taxes: Making Pollution Pay* Manchester University Press, 1994, *passim*.

80 I.E. Capacity, by use of institutions & technology, to solve ecological problems caused by industrialization

81 Especially those of Janicke: See Andersen *op. cit.* p. 54

Japan's purity is dubious: the polluting industries have simply been translocated into Korea & Taiwan! In 1974 Japan introduced a levy on SO_2 emissions, designed to raise pensions for pollution victims. This stimulated scrubber technology and in the next decade such emissions reduced drastically to 7 kg per capita (cf. 84 kg. per capita in USA), although much such industry was displaced to Korea & Taiwan[82].

[82] See OECD *Environmental Indicators* Paris, 1991.

#4. SITE REVENUE -- GENERAL

#4(a) Introductory

Only the application of labour, aided by capital (in the form of buildings, tools, machinery etc.), to land, can produce wealth. There are no other factors in production. In this context the term 'land' must be widely defined to mean the entire surface of the globe (whether covered by land or water) and all that is above or below them in the form of raw resources, atmosphere and wave-lengths in the ethers. In all free enterprise societies private monopolies to tenure of defined portions of the land ["**sites**"] are granted by law to individuals. This is essential for security & productivity, however fundamental economic distortion is inevitable if the market value of than monopoly is privatized rather than socialized.

In a Site Revenue society the annual rental value of privately-occupied sites (ignoring improvements upon them) would constitute the sole source of public finance. Sites held by elements of the Crown, churches, charities etc. would not be exempt. No other imposts of any kind would be collected, including taxes (upon income, sales, goods & services, payroll etc.) and duties (e.g. stamp, death & import duties). Against a background of high unemployment & environmental abuse, taxes on labour or earnings should be eliminated and replaced by site revenue. There would be no facility for governmental deficit financing & highly inflationary borrowings, selfishly creating burdens for generations yet unborn: governments, like individuals and corporations, would be constrained to live within their budget. Nor, as a general rule, would the public sector be involved in business: government should only do what private enterprise cannot do[83], and to the extent that government provides goods & services, user would pay.

This system[84] is sometimes called "the Single Tax", but erroneously. The revenue collected is really a payment for services (i.e. locational advantage to monopolists over sites) provided by the community: it is not a tax at all; nor is it a "rental" since the fee simple remains with the citizen.

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[83] "Society is produced by our wants and government by our wickedness; the former promotes our happiness p positively , by uniting our affections, the latter negatively, by restraining our vices. The first is a blessing, but government, even in its best state, is but a necessary evil; in its worse state, an intolerable one." -- Tom Paine *Common Sense* (1776), opening paragraphs. In a Site Revenue Society "Government would change its character and would become the administration of a great co-operative society. It would become merely the agency through which common property was administered for the common benefit." -- Henry George, *Progress and Poverty* Schalkenbach Centenary Edition, N.Y. (1979), p. 456.

[84] First propounded in detail by Henry George in *Progress and Poverty* (1879); *Social Problems* (1884); *The Condition of Labour* and *Protection or Free Trade* (1886) and *A Perplexed Philosopher* (1892).

The price[85] of a site is the transfer consideration it commands in the free market, ignoring all improvements to it[86] but in the light of its natural attributes and location amidst surrounding services, community demand & development. The annual rental value of a site is the sum which would be offered, upon the free market, for the right to occupy it (disregarding visible improvements) for one year, with a perpetual option to renew that tenure. The Nett Annual Value ["NAV"] of a site is its annual rental-value *inclusive* of improvements. NAV forms the rating base in the UK, much of the USA and some Australian States[87], and is a severe disincentive to making improvements, thus fostering inner-city decay.

If the full annual site rental is collected, all unearned increments (including, but not limited to, betterment) to the price of the site are recouped by the community. The price paid upon transfer of any site should equate with the market value of the improvements upon it. If the price exceeds that value then it contains an element of capitalized locational advantage and the site revenue is inadequate, whilst any shortfall indicates that the site revenue fixed for that location is excessive. The price of bare sites (which, after all, were given to, not made by, humanity) should be zero to any transferee willing to pay the annual assessment: improvements alone would provide collateral security to mortgagees.

Site Revenue does exist, in a limited form, in the collection of rates based exclusively upon unimproved or site values in Queensland[88] and New South Wales[89]. Numerous Commissions of Enquiry have endorsed this system[90], however it has been adulterated by inequitable & regressive "minimum rate" imposts and (since 1971) by Commonwealth allotment of some 2% on income tax for distribution amongst local authorities (which allotment constitutes some 15% of their income and is increasingly made as "tied grants"). Federally, the *Land Tax Act*, enacted in 1910 but repealed by Prime Minister Menzies in 1952, was a limited Site Revenue measure, collecting 5% of the unimproved capital value[91].

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85 The "price" of a site should be distinguished from its "value". The latter is a subjective term: a site might be a precious ecological wilderness or a noisy, polluted hole to one person, but a piece of God-forsaken bush or a marvelous commercial niche to another. Nevertheless, the expert study of land prices is properly described as "valuation".

86 (Except those which are invisible, merged with the land and requiring no maintenance -- to ignore these as well establishes the "unimproved capital value").

87 Specifically Tasmania and some regions of Victoria, where s. 320 of the *Local Government Act* allows Council-initiated polls of ratepayers (who are easily confused) on the issue.

88 Since the 1890 *Valuation and Rating Act*.

89 In 1895 the Reid government placed tax on unimproved value of land in town and country. In 1905 the *Local Rating Act* was passed by the government of Sir Joseph Carruthers and introduced rating upon the unimproved capital value of land throughout NSW except in the City of Sydney. Largely through the efforts of A.G. Huie it was introduced into the City of Sydney by R.D. Meaher, Lord Mayor, in 1915.

90 E.G. Report of Sir Alan Bridge Q.C. to the NSW Government (1960), Report chaired by Ald. N.L. Buchan to Brisbane City Council (1964), Report by Committee of Enquiry under Mr. Justice Hardy to the Queensland Government (1966); Royal Commission on Rating under the Hon. Mr. Justice Else-Mitchell to the NSW Government (1967); Committee of Enquiry into Local Government Revenue Raising in Brisbane, 1987-89 (under Sir Gordon Chalk).

91 Further elements of site- (or resource-) based revenue are present in the various royalties paid to government for use of publicly-owned minerals, forestry products, etc. in levies imposed upon crude oil and in rent for leasehold of Crown land.

#4(b) Assessment & Collection Mechanisms

It is simple to assess the annual rental-value of sites once expert valuers continuously observe the conditions of site transfer throughout the entire broad economy. In a Site Revenue economy, legislation would require details of all prices & rentals of sites to be reported and publicly displayed (thereby preventing graft), at local government level, upon cadastral maps marking the dimensions & boundaries of every site and the position of significant variables.

The Site Revenue would be collected at local government level (which should preferably be granted constitutional recognition) and remitted to higher levels of government in negotiated proportions. The process should be co-ordinated under a Commonwealth Valuer-General, with the State Valuers-General as deputies. Valuers would distinguish how much the price or rental a site commands is due to the improvements upon it and how much to the locational value of the site itself. They would declare the annual site value applying to each site, but in doing so would be performing as scrutineers & analysers (rather than manipulators & dictators) of free market forces. The annual assessment would be payable by the proprietor of each site just as rates are at present. The debt would constitute a charge against the title and could be amortized for payment after death.

Ultimately, each valuation of a site's annual rental value must be justifiable as compared to similar sites locally & nationally. Local data must be continuously cross-checked against information from brokers, auctions, the press, advertisements, land developer's brochures and advice from banks & finance agencies. An assessor, studying the flux of prices for sales & leases across an area and amassing, digesting & swapping data concerning them, will be able to establish approximate "benchmark" values for particular types & sizes of sites in particular zonings. This "benchmark" must then, with caution, be "fine tuned" in the light of conditioning variables and each site's relevant improvements. If the correct site revenue is being collected, sites should be transferred for the value of improvements alone. After a few years of high-quality valuation, as publicly displayed, annual rental-values in areas would be well known & established such that any alteration of them would be clearly & evidently traceable to the direct influence of fresh, known variables.

#4(c) Broad Economic Effects

The argument is conclusive that Site Revenue is a simple yet sovereign remedy for most of the economic ills of our time, including excessively-big government, rich-poor gap, unemployment, inflation, currency fluctuations, unjust enrichment, high interest rates and planning distortions.

Human life and civilization cannot exist without the use of land. Communism has failed all over the globe and it will not be tried again: it is clear that legally-assured, community-endorsed private monopoly[92] over specific sites (whether the use be agricultural, residential, commercial, industrial, etc.) is equally fundamental to human welfare.

Sites exist upon land, upon certain locations in the sea (e.g. moorings, oyster leases) and in the air (highrise buildings, flight paths, transmission wavelengths). They were given by Creation, not made by humanity (land reclamation partially aside), and there is no moral or rational basis for assertion of private ownership over them as if they were chattels created by labour[93]. Sites are a limited community resource essential for survival & civilization and economic sanity is impossible unless the community, having granted private monopoly over them, collects the full site revenue in return"[94]. Site Revenue constitutes the only logical & ethical source of public finance[95].

Throughout the CANZEUS countries, indeed since Tudor times[96], holding charges on

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[92] Sundry other minor, but equally unsupportable, monopolies exist in our society, e.g. egg & milk board quotas, pharmacy and newsagency density controls, constricted availability of taxi plates: in all instances an unearned increment accrues to the advantage artificially extended).

[93] "What would be the result in Heaven itself, if the people who should first get to Heaven were to parcel it out in big tracts amongst themselves?" Henry George "Justice the Object: Taxation the Means" [An address, San Franscisco, 7.2.1890].

[94] It is quite true that land monopoly is not the only monopoly that exists, but it is by far the greatest of monopolies -- it is a perpetual monopoly, and it is the mother of all other forms of monopoly." (Winston S. Churchill *The Peoples' Rights* Jonathon Cape Ed., London, 1970 at p.117). "The unearned increment in land is reaped by the land monopolist in exact proportion, no, not to the service done but to the disservice done." (Speech by Churchill at Edinburgh, 17 July 1909 as reported in his *Liberalism and the Social Problem*.

[95] "The earth, being the birthright of all mankind, its rental is the property of the people. Thus the site rent is the debt owed to the community by every landed proprietor, the duty of the State being to collect that debt as its revenue, to utilize it for the purposes of the community and not to tax." Tom Paine, *Commonsense.*

[96] Prior to the reign of Henry VIII there was a veritable Golden Age for English labour. There was no extreme poverty, prosperity was everywhere and an 8-hour day was worked. Yet by 1541 there was so much misery and vagrancy that a series of Acts to aid the destitute had to be passed. By the end of the reign of Charles II the revenue collected to relieve paupers exceeded one-third of the peacetime budget. This deplorable change in the social condition of the English people was brought about by that profligate wastrel Henry VIII, who confiscated the land of the Catholic church when he broke with Rome and dissolved the monasteries. [The fortune which Henry VIII appropriated in this way was squandered in such wanton waste and boundless extravagance of lifestyle that he died in penury.]

These lands, one-third of the kingdom, had previously been available for the peoples' use, for grazing & planting, albeit under a moderate labour fee (and their subjection to mismanagement by an increasingly-corrupt clergy). Now they were confiscated and sold to the social-climbing merchant class who "regarded the land as a commodity to be dealt with like any other, for the profit to be gained, and not merely as a source of sustenance" (H.D. Traill *Social England* Vol. 3. p. 115). The rent for agricultural land, which had been six pence per acre annually for 300 years prior to 1550, rose to an average 45 shillings in 1879. The era of rack-renting, of the rich battening upon the poor, had arrived. See generally James Edwin Thorold Rogers *The Economic Interpretation of History* (1888).

Adam Smith, dependent for his leisure to write upon employment as a tutor by a landowning Duke, was unwilling to undermine land monopoly, seeing it as the mainstay of a capitalist system with which he was ideologically sympathetic. He wished to maintain the position of the wealthy landlords and asserted, with a lack of his usual care & acuteness, that free market competition would provide plenty for all. In fact, this insulated the landlords from having to compete and crippled a free-enterprise economy from the outset. The working class only had their labour left to bargain with, and that led to two centuries of strife. See generally Fred Harrison *The Power in the Land*, Shepheard-Walwyn Ltd, London 1983.

land have been relatively mild and proprietors can hold tracts out of use pending sale at a price increased by the resultant artificial scarcity. This facilitates a vicious circle maximizing imbalance in land ownership and a rich-poor gap[97].

Site Revenue provides a severe disincentive to owning more land than one has to. Since the annual rental value collected reflects the "highest & best use" to which the market could put that site (rather than its "actual" use), Site Revenue forces optimum development & usage of, and ends speculation in, sites, assists liquidity and enhances efficient resource allocation. Unjust enrichment from "exploiting the ecosphere", "locational advantage" and "capital gains" become impossible, since the rental-value is collected and land-price is destroyed.

The expectation of pocketing the unearned increment in land prices is bad economically, since it diverts investment from productive enterprise, fosters inflation[98], encourages the holding of land off the market, and (despite popular illusion) does little to create employment or enable "trickle down" of wealth. Artificial escalation in land price diminishes the ability of site purchasers to spend on consumer goods, thereby adversely impacting across the economy, depressing activity & employment, spreading dissatisfaction & a "get rich quick" attitude, and sparking unrest over wages and political extremism.

Since Site Revenue destroys most forms of speculation, so the only feasible investment for

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Marx took a wrong turning when he failed to draw proper conclusions (in *Das Kapital* Part 8) from his own insights into the impact of dispossession from sites upon labourers and the accretionary powers of Landowners. In the resultant communist bloc this confusion led to its own unresolved disasters. In the capitalist bloc these evils have been temporarily ameliorated for a nearly a century by the palliatives of Keynesian inflationary deficit financing and -- arising from the great Depression -- socialist welfarism: now the inevitable outcome is upon us as persistent inflation renders debt-addicted national economies hostage to the financiers behind the bond markets, and they collapse into large-scale unemployment (see generally F.A. Hayek *A Tiger by the Tail: the Keynesian Legacy of Inflation* Hobart Paperback, Tonbridge Printers, Kent, 1972.

All these were fatal mistakes. Due to the vested interests spawned since the 15th century and the confusion engendered by Smith, Marx & Keynes, the debate has been one of the deaf, ignoring the central issue of land monopoly for two centuries. The glimmers of insight held by Lloyd George's ruling Liberal Party during the first decade of this century were not sufficiently focussed and were swamped by a world war, a depression and Hitler's war, followed by a Cold War, all in rapid succession. Control of the land, governments and the global economy is now firmly in the hands of financier cartels.

[97] 50% of Australians own less than 8% of the wealth, and 1% owns 22% of the wealth: P. Raskall *Journal of Political Economy* No. 2, 1978. In South America 17% of landowners control 90% of the land: Susan George *How the Other Half Dies*, Penguin 1978.

[98] Increased land prices are inflationary in the broad economy because they increase money-supply with no commensurate increase in the goods & services that money can chase. This in turn stimulates over-capacity & over-production (often of shoddy goods, with repercussions of environmental abuse) as the comparative income of producers diminishes and they strive to ride the inflationary wave and compensate for these losses. The end-result is a rash of bankruptcies, widespread unemployment (which constitutes stagflation when accompanied by inflation), downward pressure on wages, industrial strife, destruction of initiative, a collapse in confidence and reduced land & interest rates

capital would be in productive enterprise. The ever-increasing efficiency of society would threaten a continual albeit slight depreciation in the worth of money so that those with savings would be only too glad to preserve its value and to lend it without interest. Since money is properly only a medium of exchange, not a good in itself which a citizen can responsibly hold out of circulation, economic health demands that it be circulated via expenditure or loan[99].

Site Revenue meets all the criteria of a good tax[100]: it is visible & intelligible, has a high revenue potential, is economic & effective to collect, and does nothing to distort the market. Sites are essential & immovable and their supply is fixed, so collection of Site Revenue cannot warp either demand or supply (as it does with non-natural goods or services). "Tax capital and you drive it away; tax land and you drive it into use"[101].

Logically the Site Revenue fund would be more than adequate to pay for a modern government[102]. Since (a) human civilization depends upon its citizens having secure private title to land, so (b) the monopoly thus granted will possess a certain value fixed by, and reflecting, the nature of that civilization therefore (c), the annual collection of that value will suffice to fund public infrastructure for the civilization.

Since a healthy civilization is unlikely to enter retrograde decline, one would expect the site revenue fund to at least equal the sum of all present taxation (which is at the expense of site revenue), plus all unearned increments privately appropriated, plus all interest payments.

Instead of doing the simple, intelligent thing, governments worldwide (caught & distorted in the grip of vested interests) impose a welter of complex, counter-productive and inefficient taxes, upon earnings, economic activity, and even employment. At least they have, for the time being, ceased to tax windows and date palms[103].

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until the bust builds to boom and the aberrant cycle repeats itself.

[99] Perhaps unnecessarily, in *The Natural Economic Order* (Berlin, 1929), Sylvio Gesell even proposes that a "stamp duty" be payable, on dates set without warning by a committee of the Judiciary, upon all banknotes in circulation or held by banks upon a particular day: this would pressure continual spending, investment or lending in preference to hoarding of currency.

[100] See e.g. Geoffrey Brennan and James Buchanan *The Power to Tax: Analytical Foundations of a Fiscal Constitution* Cambridge University Press, Cambridge 1989.

[101] Mason Gaffney "Land Planning and the Property Tax" *Journal of the American Institute of Planners*, May 1969 p. 178.

[102] Fred Harrison *The Power in the Land* Shepheard-Walwyn, London (1983) pp. 200-207 estimates that there would be an embarrassment of riches for government. Indeed, before the influence of liberal economists this was the major fear of critics (see Steven B. Cord *Henry George: Dreamer or Realist?* Uni. of Pennsylvania Press, 1965 p. 67. The excess can always be returned to the people equally as a dividend, as with the proceeds of the silver mines in ancient Athens.

[103] "A tax on date trees, imposed by Mohammed Ali, caused the Egyptian fellahs to cut their trees; but a tax of twice the amount imposed on the land produced no such result." Henry George *Progress and Poverty* Schalkenbach

Reduction of site-price to zero, and the release of impediments upon initiative, enterprise & productivity, would mean that everyone willing to work with hand or brain would have easy access to a site, even if only for subsistence farming or as a base for part-time work. Workers, without mortgages and with ready access to their own sites, would be in a natural, strong position against capital, which would no longer (thanks to its command of sites) be able to force wages down to subsistence level. Small business would be freed from a plethora of taxes & red tape.

With the high cost of land and the burden of tariffs removed, farmers would have more capital available for environmentally safe farming. Conservation zonings & environmental protection laws would apply to prevent destructive exploitation of sites, and polluters of the atmosphere would pay (via e.g. a fuel tax) for its cleansing by vegetation. With land easily available to every farmer, so absentee owners (especially giant corporations) would find it hard & expensive to obtain labourers & managers. Agricultural land would tend to be owned by those who actually farmed it. Downturns in world commodity markets would lower the demand for, and hence the annual rental value of, rural land affected. Farmers would no longer be able to hand on a property of certain capital worth (beyond that of its improvements) to their children, but, on the other hand, those children would not need to buy land when they struck out on their own.

Homebuilders would have easy access to sites, without being mortgaged for life, and there would be a boom in the building industry. Payment of Site Revenue could not be wholly passed on to tenants because (a) destruction of land "price" would make it much easier for folk to buy their own site and (b) landlords would be so keen to keep rental sites occupied that there would be strong competition for tenants.

#4(d) Specific Planning Effects

Site Revenue would eliminate self-interested, secret & corrupt planning pressures, benefit government finances and reduce premature development.

Allowing speculators to retain a sizeable proportion of unearned increment (including elements of betterment) encourages their purchase of land suitable for various kinds of development and their holding same out of the market until prices escalate. This is a legalized fraud upon the community, whose needs and public works have driven up demand for sites.

Foundation, New York 1958 page 409.

By forcing the release of unused or underutilized sites and their optimum development, and by removing imposts on labour, undeveloped & degenerated sites would be improved, increasing the base value of total sites. It is illogical to fear over-stimulation of growth since major capital expenditure is unlikely without solid market research: moreover, it is the present system of speculation which forces excessive development. Developmental pressure would be reduced upon marginal land and urban sprawl & ribbon development would be constrained by the natural synergistic economies of spatial agglomeration, which foster efficient & shared infra-structures, broad choice, specialization, competition, social contact & communication.

Thus, a Site Revenue society would develop organically from a healthy economic basis, lessening the need for planning but not rendering it redundant since a major & responsible supervisory role would remain so as to preserve heritage pieces, protect public assets (e.g. CBD theatre areas) from commercial pressures, safeguard open space & environmental reserves, and constrain urban sprawl. There is a need to combine the freedom of entrepreneurial vigour with the broad responsibility of planning control.

There is no problem for site revenue with downzoning: the purchaser of undeveloped land zoned residential should pay nil (but incur site revenue liabilities). There is unlikely to be unfair or unpredictable loss if land is downzoned to agricultural or environment protection: true developmental potential (return on rents etc.) is cut, but so is the site revenue payable. The only exception would be where worsenment actually diminishes the value of improvements to land, and in such an instance compensation should be paid.

#4(e) Site Revenue and the Environment

(i) Overview

Site Revenue would be inherently beneficial to the environment, removing profiteering in its "developmental" value and encouraging the widespread low-impact, low-demand lifestyle so necessary for a sustainable civilization & avoidance of war.

Landowners would be inspired to beautify & improve their properties without fear of penalty and public expenditure upon habitat preserves & national parks would be viable in order to profitably augment the site value of benefited areas. No concern need be held that sites would be abused (strip-mined etc.) provided that normal CCR were in place and a range of appropriate EIEPs were applied.

(ii) Beautification

In a Site Revenue society no speculative gain could possibly accrue to tenure of sites. All holders of sites would have to pay the annual rental accruing to them. There would thus a severe disincentive to owning more land than one could directly manage productively in the face of competition, for failure to do so efficiently would lead to enforcement of the accrued site revenue debt against the improvements of some (if need be, all) of the sites held, and loss of them. It is to be expected that a great deal of under-utilized land, at present held as a hedge against inflation or for speculative reasons, or reliant upon employment of others for whom no viable alternative exists, would come on the market -- available to anyone willing to work productively -- at a price equivalent to the value of improvements upon it.

Whilst employment of labour and rental to tenants would remain, the marked trend (especially in residential, commercial & rural zones) would be towards individuals -- sometimes writ large as corporations -- owning & managing their own properties. There would be a general tendency towards tenure of highly-improved small holdings, developed & operated carefully to maximum economic advantage. With an enormous tightening of State welfare benefits, this would soak up the vast pool of welfare dependents, especially the unemployed, into a new class of low-impact, low-demand self-managing settler. This class would basically equate with the traditional peasant class, however at this turn of the spiral it would be politically free, able to live well with only part-time labour in the cash economy, and blessed with all the advantages of the information age.

This structure of independence & proprietorship would instill the powerful motivation of personal interest and responsibility, inspiring settlers to improve the quality & viability of the holding so as to enhance its long-term, reliable productivity with a view to handing it on to the next generation. Site Revenue encourages site-holders to improve and beautify their holding, whether it be urban or rural, by appropriate landscaping and conservation measures. Caring is natural to those with a real stake in their environments. Those who do care and improve their holding incur no extra revenue obligations, since the annual site value is calculated against the average, unimproved land of that locality4. Those who do not improve their sites will be less able to compete for tenants.

Site Revenue would force maximum utilization of holdings and would end tenure of sites for speculative reasons. This would release masses of land onto the market, especially at marginal locations (e.g. desert fringes). This land could be obtained cheaply by the community and dedicated as national parks (preferably with broad inter-linking swathes), or as local beauty-spots, which would bear no Site Revenue obligations.

Public policy encourages farming of marginal land, and hence agricultural sprawl, by allowing

urbanization of fertile land (and, even worse, allowing individuals to pocket unearned windfall profits for doing so); rating unused (or under-used) land, often held for speculative purposes, at the same rate as productive land; subsidizing the dumping or destruction of surpluses (not an Australian sin); and artificially facilitating the spread of preferred crops at expense elsewhere (eg permitting irrigation of cotton at the expense of waters needed to reinvigorate or flush river systems). The quest for unearned increments to land value is the driving force behind excessive sprawl of all kinds, urban, agricultural & industrial, and in the instance of agricultural land replaces the genuine steward with an unnatural class of absentee owner who cannot work the land personally and so employs others to do so using the "efficient" perversion of monocultural, inorganic chemical farming.

> The prospect of a windfall increase in land value operates as a standing invitation to 'develop" land by seeking approval for a change of use -- regardless of whether the proposed development is genuinely needed. Which means that, irrespective of its environmental significance, or the need to maintain some clear demarcation between town and country and curb the environmentally destructive process of urban sprawl, *all* land becomes vulnerable to entrepreneurial initiatives.[104]

War (especially nuclear) wastes and damages the environment and is caused by nationalistic land-hunger, resource-grabbing and governmental direction of citizen disgruntlement away from home economic problems (e.g. boom & slump, unemployment, rich-poor gap) which are invariably occasioned by land monopoly Site Revenue prevents private profiteering out of raw resources, diminishes central government and national boundaries and founds economic stability upon rock. It is, therefore, the indicated remedy against war.

(iii) Site Bounties

In some instances, particularly forestry, growing of the resource has extensive side-benefits, such as enhancing the visual amenity of other sites (hence increasing their locational value & site revenue), enabling photosynthesis of CO_2 and (in other than conifer plantations) supplying wildlife habitat.

Landowners rarely receive any economic incentive to preserve treecover or natural habitat. On the contrary, in Australia, for many years Crown leases required active land clearing. Usually the most profitable (economically) use of rural land requires clearance of vegetation to facilitate grazing or agriculture. Despite the possibility of differential rating being available under Australian legislation[105], no local authorities in fact give rates reductions for preservation of habitat, even where the land is dedicated (and its title encumbered) as a Nature Refuge106. Nor is dedication for habitat preservation considered to be a charity for which stamp duty relief is available107. Overseas, there are exceptions: commercial woodlots in the UK are rated at 1/3 their assumed income were they unimproved pasture.

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[104] Philip Day *Land* Australian Academic Press, 1995, p.3.
[105] EG s.568 of the *Local Government Act* (Qld., 1993)
[106] Under the *Nature Conservation Act* (Qld., 1992).
[107] Under s.59E of the *Stamp Act* (Qld. 1894-1988)

Under an environmentally-sensitive Site Revenue system, assessors of site values should be mindful to give credit where credit is due. Thus, if a voluntary (and perhaps commercially sacrificial) beautification or preservation of one site increases the value of others, then a "negative rental" or bounty should accrue, in much the same way as domestic solar generators achieving a nett input to the electricity grid receive payment.

Herein lies a mechanism for rendering equity to those developing nations which yet retain extensive natural vegetation. Rather than economically encourage or force them to cut it down, rather they should receive (out of levies collected in respect of atmospheric externalities) continuous bounties from developed, atmospheric polluting nations in respect of the contribution to homeostasis thereby contributed. Those nations who preserve habitat benefiting fauna would also receive bounties in respect thereof, payable from the national & global trust fund comprising 50% of all income in respect of licenses to extract raw resources[108].

(iv) Site Degradation

Critics sometimes allege that, when subjected to a Site Revenue system, rural landowners would respond by over-exploiting their land so as to pay, or be able to pay. This allegation is hypocritical and unfounded. It is the existing high price of land and interest rates (both of which are ended by Site Revenue) which already make landowners over-exploit their soils. Moreover, in a Site Revenue society protective environmental laws would remain in force and enable community interference in any illicit mining (e.g. of topsoil), poisoning, timber-harvesting, clearing or erosion.

Furthermore, the amount of Site Revenue payable is determined by market forces (not government edict) according to the average financial return possible from land in a locality. If there is a drought, bushfire, downturn in pertinent commodity prices etc. then the local market will reflect this with decreased annual site values. Usually, the amount due would be less than that extracted under present taxation systems.

Finally, a site-holder who degrades his land would eventually find it failing to provide adequate income for the annual revenue requirements (which would reflect general landforms locally and be assessed according to the previous, unexploited, legitimate status of the site). Such a one would eventually lose greatly, for the degraded site could not be transferred for the value of its improvements.

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[108] See *supra*, section 3(d)(x), infra section 5(f)(ii).

(v) Site Revenue, Resource Extraction & Externalities

In a Site Revenue civilization resources could no longer be exploited cheaply for private gain. Factored into site revenue would necessarily be royalties upon resource extraction and impact levies upon pollution. These aspects are dealt with below[109].

4(f) Political Realities

Site Revenue is a completely viable solution[110] for economic & planning ills. It is neither "communist" nor "capitalist", but it has never been wholly implemented, and in fact has been deliberately repressed from public debate[111] by vested interests for over a century. Partial collection of the unearned increment was a salient theme during the formative years of ALP politics in the 1890's[112], indeed its total collection was ALP policy in South Australia until 1905, but worker-wavering over the viability of free trade and political pandering to the middle class saw the introduction of "thresholds" and its gradual demise until in 1964 the concept was removed "by subterfuge" without debate from the ALP policy reprint[113].

Sadly, established and vested interests "dwell upon the heights" across the globe and everywhere beat back reason & decency so as to buttress the parasitic, profiteering privilege of the powerful. Site monopolies are everywhere granted without community collection of site revenue[114]. The result

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[109] See Chapter 5.

[110] All salient arguments against the Site Revenue analysis have been painstakingly dismissed by e.g. Steven B. Cord in *Henry George: Dreamer or Realist* (University of Pennsylvania Press 1965) and Robert V. Andelson (ed.) *Critics of Henry George* (Associated University Presses 1979).

[111] For instance, all advocates of the proposal, however qualified, were refused an invitation to the "National Tax Summit" called by Prime Minister Hawke in 1985, despite the reform satisfying all except the last ("popular support") of the nine "principles" supposed to qualify an invitee: no increase in overall tax burden, reduction in income tax, tax avoidance & evasion lessened, simplicity, fairness, no disadvantage to welfare dependents, no agitation of wage movements, promotional of investment, growth & employment.

[112] See *passim* Verity Burgmann *In our Time*, Allen & Unwin 1985 and Airlie Worral *The New Crusade: Origins, Activities and Influence of the Australian Single Tax Leagues 1889-1895* M.A. Thesis, Melbourne, 1978.

[113] See Clyde Cameron June & July 1984 *Progress.*

[114] Besides the partial implementation of Site Revenue in Australia as traversed, the only other attempts have been in Denmark, Singapore and Taiwan. After lobbying for three years, in 1956 the Danish Justice Party secured a promise (largely unfulfilled) of taxes on increments in site values for its participation in a coalition government. Land speculation ceased immediately and all investment went into productivity. By 1960 a big deficit on the national balance of payments was turned into a surplus and the large foreign debt was reduced to one-quarter. Interest rates and rents diminished and there was nearly full employment. Inflation halted and there was industrial peace. Then, at the 1960 general election huge propaganda-expenditure by rich landlords and a change in the voting system halved support for the party, which lost its balance of power and the advances collapsed.

is to capitalize community-generated locational advantages as "land price" and "profit" in the pockets of the "proprietors". This beats the masses into landlessness (or lifelong enslavement to mortgagees) and strips them of employment. Lulled by the "bread & circuses" of welfare & television, the masses, poorly-educated & preoccupied with survival, stumble along stunned by the enormity of the "problem".

All the most powerful sectors of society are against Site Revenue. Politicians dislike it because it decentralizes power and promotes natural peace, harmony & equality, thus ending the divisions upon which they feed: yet political manipulation of monetarism will never address the fundamentals of economic malaise. The rich and financiers, who control the media and manipulate politicians, dislike it because it ends two of the three bases for their wealth (the third is enabled by legislative interference with "morality") -- to wit pocketing the unearned increments from land monopoly (including resource exploitation) and the ability to command interest rates (which is a spin-off thereof). Trade Unionists are against Site Revenue because an independent workforce and an even distribution of capital would destroy their empire. The Middle Classes, struggling to maintain a decent living, are scared to endorse the concept because it appears to threaten that "capitalized land price" which forms the backbone of their apparent assets[115]. The voluntarily unemployed hate the concept because it will force them to think, work and take responsibility for their own lives. These elements will combine in unsubstantiated assertion to shallowly dismiss Site Revenue as "crackpot Utopianism".

Resulting from the influence of Dr. Sun Yat Sen, taxes on increments in site values were, after 1950, in large part collected as the centrepiece of a strategy for economic recovery in Taiwan. As a result, rural incomes increasingly equalized and land came into the hands of efficient farmers rather than absentee landlords. Capital, previously bound up in land speculation, was freed for industrial investment. But the rates of rental-value collected became inadequate enabling capitalization of increments. Both deliberate speculation and widespread unearned profiteering from locational advantage returned, especially on the urban fringe: (Fred Harrison *The Power in the Land* Shepheard-Walwyn, London 1983, pp. 226-229).

[115] (Even though realistically a homeowner would be no worse off selling one holding for the value of improvements alone, *sans* land price element, if s/he were then able to buy again elsewhere upon the same basis).

#5. STRUCTURE & OPERATION OF ECONOMIC INSTRUMENTS FOR ENVIRONMENTAL PURPOSES

#5(a) Overview

In order to avoid problems of State failure, EIEPS must be administered by independent authorities. The quantum of revenue collected should, wherever possible, be set by public tender or auction, but a minimal reserve must be set to prevent industry abuse (by collusion or monopoly) and to as to protect existence & bequest values. Different concerns arise where the impact is by way of point or non-point pollution, or via extract of a renewable or a non-renewable resource. All EIEP revenue should be earmarked & applied in work pertinent to redressing or ameliorating the relevant impact or extraction.

#5(b) Independent Authorities

All monitoring & planning should be conducted by independent specialist authorities, each constituted as a self-financing corporation with the State as sole shareholder. The boards of the authorities must reflect all "players" but, albeit containing political/bureaucratic, concerned citizen & industry representatives, must be dominated by academics. Only in this way can the boards be guided by scientific & intellectual objectivity (responsible, of course, to peer criticism), free of economic distortions, extremist warping & political pressure. Authorities should be established in every field where development impacts environment. These fields would include forestry, fisheries, agriculture, irrigation, grazing, native fauna, native flora, organic waste disposal, hazardous waste disposal, non-replaceable resource extraction etc.

The constitution & mix of the boards should be defined by statute and, aside from the minority political/bureaucratic nominees, all appointees should be elected by their respective constituencies (ie learned academies & societies and industry federations), not nominated politically. Board members should be paid appropriately and should have the fiduciary duties of company directors. Each authority must be independently audited and supply a detailed public report, annually.

All planning & approval decisions must be taken out of the corruptible hands of malleable,

vote-prone elected bodies (especially local councils) and given to independent authorities. Due endorsement by relevant authorities (eg of the native fauna & agricultural authorities to urban expansion) should be required before any development proceeds. An appeal process (activated by any developer, authority or objector) against any approval or refusal thereof should be available to a Tribunal, of Supreme Court rank, consisting of two relevant specialists and one judge.

Authorities should neither be too big nor too small: they should be organized on an appropriate regional basis which enables specialist knowledge & personal contact. However, it may often be appropriate to require reporting to & monitoring by an inter-regional authority (and even these by a global authority).

Each authority should be totally responsible for administration & planning within its area of responsibility. All monitoring, information & planning it conducts & collates in order to enhance its predictive capability, together with its defined Safe Minimum Standard [SMS] and hence Maximum Sustainable Yield [MSY] quota of biostock available for annual harvesting, resource extraction permitted or polluting licenses tolerable, should be public & transparent. An express statutory duty should be to educate & inform the public, regularly and (via specialist circulating lecturers) at every educational level from kindergarten up, regarding the use & conservation of its stock and the threats & pressures thereon.

Each authority would usually maintain substantial insurances in the event of unforeseen disasters for which they are responsible (eg collapse of core stock, unforeseen collateral impacts on other species, or external disaster against which there is responsibility to guard, such as bushfire, disease-penetration or oil-spill). Each authority (and, subject to the usual law, its directors personally) should be liable to peak industry groups should it neglect its core statutory duty to *bona fide*, using best-available knowledge, assess & monitor SMS. Whilst the setting of reduced quotas might inflate scarcity prices and might indicate poor analysis & projection, the authority should incur no liability in that regard.

Each authority should be responsible to organize, publicize & conduct a regular auction for sale of harvesting rights over the forthcoming quota, such quota being the excess stock available for exploitation without impacting SMS. The authority should calculate & pre-publish the reserve price at which the quota (or parts thereof) is offered. There should be no calculation of "optimal" prices -- the price bid should be a matter for the free market, having full awareness as to the authority's researches, the quota limits and harvesting conditions. Quotas should be transferable, whether or not at profit, to any approved & qualified transferee.

Quotas may be auctioned subject to conditions (eg of reforestation, rehabilitation measures, or stock protection using constraints on net types & by-catches), and the timing or pulsing of harvest may be defined to maximize yield but avert impacts on breeding. The proceeds of auctions must cover the cost of each authority's entire operations and the cost of any remedial works it adopts. Any surplus must be held in trust against future need and applied to build up capital or knowledge for exploitation of lower-grade resources or invested in secure commercial ventures.

It is a regular, steady, permanent sustainable yield which must be calculated, without any permission for depletion on the basis that future restraints will allow regeneration.

#5(c) Calculation of Charges

(i) Introductory

The aim of all EIEP charges should be to collect at source, and (where possible & appropriate) apply directly in mitigation, such revenue as, by balancing of the Pareto efficiencies or effect of such mitigation, totally neutralizes the externality. No discounting of whatever kind (eg by freeloading upon natural cleansing or out of concern for 'employment' or 'poor folks' budgets') should be permitted. This approach totally depoliticizes the environmental debate.

All point pollution, of whatever kind, should be 100% neutralized at end-of-pipe using available new technologies, and the cost thereof borne by the polluter. Pollution prevention saves the high cost of regulation and of possible remediation (with massive costs of cleanup and health bills), but zero pollution is not technically or economically possible across all sources everywhere. All non-point pollution, whilst by definition not immediately capable of neutralization, should be constrained by the level of EIEP charge and, in the longer term, addressed by remediation. For example, levies should be placed on fossil fuels at point of sale, with payment made using Smart Card technology which reflects attenuating capital devices installed, and all proceeds should be applied to carbon sequestration via afforestation.

All renewable resources (forests, fish) should be managed by independent authorities charged to assess the Safe Minimum Stock ["**SMS**"] of species involved and the Maximum Sustainable Yield ["**MSY**"] available for public auction or tender each year.
All non-renewable resource extraction should be administered by responsible independent authorities

operating on a continual 1000-year budget. Available quotas for each year (or over 5-10 year periods as may be practicable given infrastructural commitments), such quotas reflecting market demand as against known economically-extractable reserves, should be made available for public auction annually. No special consideration, other than repayment of disbursements plus appropriate bonuses or royalties, should be extended to finders.

(ii) Target of the Charge

As a general rule the rental should be collected from the polluter (ie the manufacturer or industrialist), not directly from the ultimate consumer. This approach is more efficient given economy of scale in monitoring & collection. Inevitably the rental will be passed on to the beneficiary. In some instances, where there is a tight & well-monitored distribution system (eg liquid fossil fuels), it may be appropriate & easy to collect the rental at the pump from the ultimate consumer. Using "Smart-Card" EFTPOS payment, such user-specific collection could facilitate individualized "fine tuning" geared to installation of extra control devices, such as catalytic converters.

A discretion to allow delays must be distinguished from the implementation of pollution rentals by stages. Firms, their capital structures and employment patterns have all evolved on the presumption of unrequited externalities. The sudden collection of rental in respect of those externalities might breed avoidable chaos. It is essential, however, that the entire scheme be implemented firmly & swiftly, and the time permitted should not exceed three years, with an extra one-third of the rental being collected annually.

(iii) Discounting

"Discounting" argues, from an anthropocentric perspective, that existing humanity has a right to pollute, for various reasons, and/or may do so at the expense of future generations. The supporting arguments are:

Homeostasis: Humanity is entitled to pollute at whatever rate bio-geo-chemical homeostasis, via the oceans & vegetation, manages to cleanse our wastes. The natural environment has considerable ability to transport & diffuse wastes and to transform them chemically or by radionuclide decay: thus, to a certain extent, bio-geo-chemical homeostasis can maintain an equilibrium in the face of pollution ["**the Gaia hypothesis**"]. For instance **(a)** approximately half of global CO_2 is sequestrated by oceanic & vegetative processes[116] and **(b)** with increased planetary warmth oceanic plankton

[116] "Grappling with Greenhouse", National Greenhouse Advisory Committee, Department of Arts, Sport, Environment & Territories, 1992, p. 9

produces excess dimethylsulphide, which in turn increases cloud cover, reflecting heat back into space and allowing the planet to cool. Environmental toxicology has some ability to monitor the self-purifying, accomodative or assimilative capacity of any specific environment. Some immediate environments (e.g. fast rivers, tidal oceans, windy skies) may be more resilient & robust that others, but often at the expense of some distant sink which, due to its vastness, may take a long time to accumulate & gradually register but which suddenly erupt or collapse in a "non-linear break point".

It would be foolish, however, to push homeostasis too far. Modern impacts are complicated & integrative, frustrating analysis & designation of responsibility & engendering impacts elsewhere, and their rate is unprecedented. Amongst other things, modern impacts have occasioned the greatest rate of species extinction since the age of the dinosaurs, tripled the concentration of methane in ice-cores[117] and eaten a hole in the stratospheric ozone layer enabling entry of ultraviolet light which kills plankton. There is evidence that increased CO_2 concentrations, whilst acting as a fertilizer for photosynthesis, is speeding up vegetative respiration, stressing plants (especially in Arctic & tundra areas)[118].

The precautionary principle[119] says "where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat". Biological diversity is expressly endorsed by IGAE[120]. In other words, be cautious in the face of scientific uncertainty --- or, if you don't know the results for sure, don't do it. This is especially wise since human society is becoming more specialized & dependent (eg upon mechanized production of genetically-narrow food from artificially fertilized land), and so is losing resilience against substantial climatic or environmental change.

Substitution, New Discovery & Technological Fixes: Those wishing forthwith to expropriate

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[117] Rasmussen R.A. and Khalil M.A.K. "Atmospheric methane in the recent and ancient atmospheres", 1989 *Geophys. Res.* 11599.

[118] Richard A. Houghton and George M. Woodwell, "Global Climatic Change", *Scientific American* 260 (April 1989), 36-44.

[119] Expressed in may international conventions, including the *1992 Convention on Biological Diversity*, which Australia has ratified. This principle is not part of Australian domestic law: it is present but not mandatory. See: *Leatch v NPWS and Shoalhaven CC* (1993) 81 LGERA 270 L&E Ct, NSW (Stein J.); *Nicholls v D-G NPWS* (1994) 84 LGERA 397 (Qld. PEC, Talbot J); *Greenpeace Australia Ltd v Redbank Power Company Pty Ltd and Singleton Council*(1995) 86 LGERA 143 (NSW LEC, Pearlman CJ). The principle is defined & endorsed by the Australian Inter-Governmental Agreement on the Environment (1992):.

> **3.5.1** precautionary principle -
> Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
> In the application of the precautionary principle, public and private decisions should be guided by:
> (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
> (ii) an assessment of the risk-weighted consequences of various options.

[120] **3.5.3** "conservation of biological diversity and ecological integrity should be a fundamental consideration".

or decimate environmental capital frequently assert that future humanity is bound to develop substitute alternative materials, discover more resources or develop technological fixes, thereby redressing any erroneous impacts made now. Thus they may say "decimation of wild fish stocks is fine since compressed krill & farmed fish will replace them", or "if we run out of superalloys for turbine blades, we can will develop ceramics" or "burn up the fossil fuel, inventive humanity will find a substitute", or “build out & mine the fertile land, let it salinate & erode: we will grow the planet’s food using highrise hydroponics”.

Aside from the paucity of moral & existence values inherent in such assertions, their sheer inadequacy is staggering. Such reliance gambles heavily both on the asserted substitutes eventuating and on the biosphere accommodating the resulting chain reactions. Even the most sophisticated scientific analyses can be fatally flawed. These justifications are empty. We know for sure that future generations will have the same need for clean food, air & water as we do: there is no rational reason for assuming that science will come up with some technological "fix" to pollution, toxicity, salination etc. Indeed, it is rational to do everything possible to avert a known risk: prudent risk-aversion and the precautionary principle urge maintenance of the present biospherical balance.

Social Discounting: This argues that economic benefits (employment etc.) and social benefits (e.g. low income earners being able to afford extensive consumer goods & fuels) offset & justify environmental degradation. Taking the argument at its best, the nature & quality of those goods & services would have to be objectively scrutinized. For years, millions of styrofoam hamburger boxed were manufactured using ozone-depleting substances: the fact a good is commonly used, convenient or in high demand is not decisive in itself.

This argument betrays a "1950's cowboy" mentality, where neoclassical economics prevailed and the environment still appeared to be available for endless exploitation. The “social discounting” argument should not be entertained at all. Environmental health is logically prior, paramount, a *sine qua non*, and both the jobs market & regions must adapt to facilitate it. Given a clear & even playing field wherein pollution rentals will be collected inexorably, the free market will adapt (as it has -- in the face of dire predictions -- when tariffs were lowered, child labour abolished, compulsory safety standards set etc.), especially with the assistance of governmental overview and retraining schemes. The total macro-economic burden of pollution rentals would be negligible.

It adds endless dimensions of political favouritism, complexity & bureaucratism, and is inappropriate, for government to grant rebates, allow delays, embark on remedial measures, or

otherwise manipulate pollution on the ground that they would raise prices & diminish consumption of relevant goods, thereby causing unemployment or even blight regional prosperity. No favouritism should be shown to old equipment or slow-growing industries.

Priority for Instant Satisfaction; Offsets for Future Wealth: Liberal & nihilist extremists will argue that satisfying instant impatience deserves priority: there is a right to "socially discount" the current capitalized value of future impacts. The usual discount rate is geared to interest rates and at 5% a current value now of say $1000 to save a tree would be notionally discounted to a present value of $87 to have it there for oneself 50 years hence. To designate that $87 as being what it is worth now to some other person yet unborn is an indefensible subjectivist imposition which constricts human life to a series of discrete acts of material consumption and betrays the reality of human identity through time.

As regards biological stocks (fish, timber etc.) it is sometimes asserted that any discount rate is appropriate so long as it enables operators' profits to match returns on human capital. Thus, if cash investment is earning 10% p.a. then a fishing fleet, after payment of all overheads (including labour) and allowance for depreciation, should be allowed to take so much fish as earns it 10% pa on its capital. This approach, besides ignoring existence & bequest values, "puts the cart before the horse" and is ridiculously illogical whilst ever returns on cash investment inadequately reflect environmental externalities. This approach can only lead to the disastrous destruction or decimation of whole species (eg toheroa shellfish, the New Zealand moa, humpback whales or as approached being the case with bluefin tuna & Atlantic cod). Besides, significant external benefits, both to other symbiotic species and to humanity (eg in the provision of unexpected medicinal sources or in ecotourism) is frequently associated with conservation of stocks of natural capital. Ultimately, any concoction of "economically efficient discount rates" as justifying destruction or decimation of any natural stock is a stupid & incestuous exercise.

If existence & bequest values are heavily discounted then, from a crude anthropocentric "efficiency" point of view, it may be "economic" to extinguish a particular biological stock (eg whales) and convert the meat-oil-bone proceeds into human capital (eg money hence machinery) from which higher dollar yields can be created than if we had bothered to let the whales still swim around.

It is also argued future increases in wealth will marginalize downsides imposed by prior generations,

yet, quite apart from the moral problem of international wealth disparity, it is irrational (given depletion of non-renewable resources & climate change) to presume that future generations will be wealthier that present ones.

(iv) Purpose of Reserve Benchmarks

There is little need for administering authorities to fix reserve benchmarks (prices which bidders must reach before any contract is effected) where quotas for exploitation or extraction of renewable or non-renewable resources are being opened for tender or auctioned. Such quotas would usually, by definition, be subject to intense market demand. However, there is some possibility of industries (eg loggers) colluding to keep bids low.

The situation is very different if rights to pollute are being auctioned. In that instance, polluting industries would have strong temptation to collude. To guard against abuse, authorities should set benchmarks, below which the quota will not issue, which reflect the known economic cost of remediating each specific externality. Thus, if the known cost of sequestering carbon by afforestation is $100 per tonne of CO_2, then that should be the minimum acceptable bid or tender per quota to pollute atmosphere with that volume of that gas. Whilst initially methods of testing for pollutants and for stipulating the rentals payable in respect of them will be "rough & ready" (as are most taxes, duties & imposts at present anyway), fine-tuning will evolve over time.

(d) Assessment of EIEPS for Point Pollution

(i) The Nature of Point Pollution

Sources of pollution may be fixed point, in that they can be directly traced to a specific orifice (eg smokestack or sewage outfall), or non-point (eg urban smog, acid rain, eutrophication of rivers & lakes, or leakage of nitrification of groundwater). The former are comparatively easy to quantify and investigate. The latter can only be dissected and controlled by tracing back to fixed sources (eg automobile exhausts, smokestacks, detergents & fertilizers).

(ii) Difficulties in Monitoring & Assessing Point Pollution

Many and complex difficulties arise in measuring both the quantum and the impact from the vast multiplicity of pollutants & sources which exist, and this remains true even where those sources are fixed points. Indicators of the quantity & intensity of pollution will be affected by the time & method of monitoring and a host of site-specific factors (water temperature, tidal conditions, rate of river flow, rate & direction of wind). Major practical difficulties arise in monitoring some types of pollution, such as the amount of heavy metal in the continuous discharge of an industrial facility into a bay or river. The impacts of identical industrial inputs & outputs may vary since catalytic converters or scrubbers reduce the toxicity of exhausts and electrostatic dust collectors & screens can precipitate particulate wastes.

Despite all of this, reasonably accurate assessment of releases to the environment can be estimated[121]. There area range of tools available, such as deriving the knowledge from the quantum of raw material input, averaging random samples and extrapolating from known details for equivalent operations. As an added precaution, heavy fines should always be stipulated should random sampling evidence breach of maximum licensed discharge toxicities.

(iii) Categories of Wastes

Wastes are either industrial (hazardous or non-hazardous) or municipal, the latter being generated at about 0.7 tonnes per person annually in western societies.

The greatest complexity cuts in with a wide array of specific & technical industrial pollutants. Whilst these are often of enormous potency and substantial in themselves, to maintain perspective it should be stressed that this entire sector is responsible for only some 10% of CO_2 emissions: it is, however, responsible for almost the entirety of general greenhouse gases. The assessment of pollutants from this sector involves specific scientific calculation on a case-by-case basis, having regard to the potency & life of the pollutant and the ameliorative processes available. Even where the bulk of pollution from a particular source can be monitored at a point, and despite installation of recovery systems (drying rooms, scrubbers, discharge stacks), there are bound to be fugitive gas emissions leaking from joints & valves, volatization from open vessels, evaporation from paints cleaners & solvents, escape of distillation fractions, washings from containers & pipes, spills, sweepings, discard of spent catalysts and distribution via stormwater.

Wastes will be hazardous when they are toxic, flammable, explosive, infective or corrosive. They will be intractable when they cannot be readily neutralized or destroyed by processing. The more

serious industrial wastes, which are often inorganic, are unsuitable for disposal via municipal refuse & sewerage systems and require specialist removal, storage, processing, destruction or -- more usually, unfortunately -- simple dumping in a way which, hopefully, will not leak into the biosphere or leach into groundwater. At present dumping fees fall short of true impacts because governments are afraid of driving business away or creating unemployment.

The potency of such wastes can lead to illness, chromosomal aberrations, genetic damage, birth defects or even death. No chemical should be released for public sale without security being provided by its manufacturers and by patentor/guarantors, and without approval by an independent & professional public authority (completely funded & insured by applicants' fees). In the event of a successful claim for damages (eg thalidomide), or upon any banning of a product (eg DDT, chlordane, halogens), the relevant patent should be voided without compensation, damages awarded should be paid and all stocks held by the public should be redeemed at cost price, by equal contribution (1/3 each) of those parties.

(iv) Neutralization of Non-Hazardous Wastes

A broad range of non-hazardous solid & liquid wastes are already collected & dealt with by local authorities using municipal or trade refuse collection systems, or via the sewerage system. The cost of collecting, sorting & recycling such wastes, and the comparative efficiency of various methods, is well recorded in the books of local authorities and is already collected, via local rates, on a flat-fee basis, since a strict user-pays basis (geared to volume) might encourage illegal dumping. A variety of acts permit such charging[122]. Basic scientific indicators of pollution (such as the biochemical oxygen demand ["BOD"] of material -- eg starches -- suspended in trade effluent) can enable reasonably accurate assessment of processing costs.

At present most municipal waste, perhaps after some extraction for recycling, is landfilled or incinerated, but fill sites are unpopular and incineration pollutes. Most organic wastes (papers, foodstuffs, sewerage, starches & oils) can be remediated by composting, oxygenation & settling.

(v) Neutralization of Hazardous Wastes

[121] Cheremisinoff, NP & PN, *Hazardous Materials and Waste Management* Noyes Publications 1995. p.143

Various biological, chemical and thermal treatments exist to enable the minimization or even elimination of toxicity from all but the most intractable hazardous wastes. Indeed, in many instances the resultant sludges can be recycled or used in some way. These processes involve substantial costs: facilities for the transportation & disposal of hazardous wastes especially are complex & expensive. As regards hazardous wastes, strict CCRs should always control their production, use, transportation & disposal. Such CCRs should require total neutralization of the wastes (not mere fixing in landfills), with competitive private operators providing the relevant services and the polluter bearing full market costs.

Approximately half of industrial waste, including such major sectors as spent solvents & oils (some 70%) and used tyres, is combustible. In itself, this can create large quantities of dangerous atmospheric pollution, however there are methods of incineration which avoid this outcome. The co-firing of hazardous wastes (of all known kinds) with the standard primary fuel (coal & waste oil) in high temperature (2000+^{o}C) cement kilns (which are lined with special brick and have a highly turbulent combustion zone with long retention time), ensures 99.9 destruction. Such co-firing can also take place with combustible refuse-derived fuel ["RDF"]: RDF could replace 15-20% of kiln fuel at minimal capital cost. By using existing cement kiln structures, the cost of constructing specialist incineration plants is entirely avoided, although there would be need to install reception bays, testing labs and amended injection procedures. The resultant gases & particulate dusts can be effectively scrubbed by electrostatic precipitators & baghouse filters, whilst the heavy (metal) residues are trapped in recyclable clinker ash. Alkaline limestone traps SO_2 emissions. In this way, both the energy and chemical values of all the wastes are recovered. There is no significant change in particulate or toxic emission, with such wastes being 99.9% destroyed or fixed in clinker.[123] Unfortunately, utilization of this potential is at present unlikely in Australia for no greater reason than manufacturer reluctance to deal with potential adverse public reaction and perceived adverse effects on the quality of the product (i.e. cement): there are no technical impediments[124].

Combustion of coal & smelting emit many gasses, especially sulphuric & nitric oxides. These can be collected by scrubbing, producing stocks of acid, but the process is more expensive than the end-product is valuable. Scrubbing must therefore be enforced by regulation lest smog & acid rain

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[122] See eg *Local Government Act* (Qld, 1993) ss.567, 568; *Public Health Act* (UK 1961).

[123] Michael Nisbet "Resource Recovery: the Cement Kiln Solution" in Air & Waste Management Association (Conference Proceedings) *Hazardous Waste Management in the '90s: Moving from Remediation to Practical Preventive Strategies*, AWMA 1989, p.125. See also: US Department of Commerce *Evaluation of Hazardous Waste Incineration in a Lime Kiln* US Environmental Protection Authority, 1984.

[124] Commonwealth Environment Protection Agency Review Report Number 2 *Appropriate Technologies for the Treatment of Scheduled Wastes* EPA (November, 1995), p.xiii, 38-39.

result. Fly-ash, an end-product of coal-burning recovered in huge amounts by electrostatic precipitators in the stacks of industrial furnaces, can be mixed with acids to form a hard, impermeable substance suitable for long term storage and potentially mineable for certain low-grade ores.

Another method of hazardous waste disposal is by admixture in supercritical water, ie water at 374+^{o}C and under a pressure of 22.1 m.pa. All gases & organic compounds, as well as some oxidizable inorganics such as ammonia & cyanide, provided p[article size is <200 microns (which eliminates soil) are soluble by immersion in supercritical water with added oxygen for as little as one minute. Such conditions thrust the molecules into intimate single-phase contact and reduce the wastes to water (or near potable quality) plus a few harmless gases (O_2 & N_2 & $C0_2$): inorganic salts are removed as solids. The vessel can be usefully cooled by heating water for steam production. The costs is $80-130 pcm ($0.30-$0.50 per gal), but could be halved with economy of scale.

Pyroplasmic thermal technologies, operating at about 15,000^{o} C and usually applied to a fluid waste stream, dissociate toxic organic molecules (even as intractable as PCB & 1,2,4-trichlorobenzene) into their atomic components and recombine them to form harmless and often useful products. Photolysis irradiates hazardous chemicals (in unheated oxygenated aqueous solution) with ultraviolet radiation, thereby cleaving chlorine bonds. Electric pyrolyzers, operating at about 1700^{o}C (but at substantial cost), dissociate organic from inorganic wastes in sludges, contaminated sites or tailings piles, and vitrify the latter into a non-leachable glass. Waste gases are caustically scrubbed to remove acidity and the balance discharged to the atmosphere. The "KPEG" & BCD processes dechlorinate solids[125]whilst oxygen-irradiation cleaves C-Cl bonds and dechlorinates aqueous streams. Mercury (a major ingredient in domestic batteries and in gold mining processes) can be removed from aqueous steams when it is suspended in microemulsion containing a cation exchanger Persistent organo-pollutants such as PCBs & DDT can be biodegraded by white rot fungi *phanerochaete chrysosporium*, or by the Base Catalysed Dechlorination [BCD] system. Non-thermal processes can extract critical chemicals from fluids & sludges.

An extensive examination of advanced disposal methods for hazardous waste is being performed by the Commonwealth Environment Protection Agency and pilot plants are being studied[126]. However, organization of an advanced process is rendered difficult by the comparatively low volumes of

[125] At an indicated cost of $250-$400 per tonne for contaminated soils; $1000 per tonne where the contamination is PCB: EPA Review Report Number 2, op. cit. P. 25

[126] See Review report Number 2 *Appropriate Technologies for the Treatment of Scheduled Wastes* EPA (Nov, 1995)

hazardous waste, their widespread distribution, confusion over identification & reporting requirements and difficulties in community consultation especially for mobile licensing.

(e) Assessment of EIEPS for Non-Point Pollution

(i) The Nature of Non-Point Pollution

A large proportion of environmental degradation stems from a multitude of relatively small, diverse & mobile sources which are considered "non-points" because their pollution is not readily untraceable to any specific source or orifice. Non-point pollution cannot readily be traced to a specific source.

The big offenders are agricultural (eg erosion, salination, impacted soil, fertilizers, herbicides, pesticides, feedlot run-off etc. -- often percolating underground); forestry, mining & construction (erosion, leaching, fluid leakage, dust & explosives); domestic septic tanks; rooftops, roads & paving (stormwater & litter); onsite industrial waste dumps & moonlight dumpers. Landfill too can be negative when it ousts filtering wetlands. Non-point entomological pollution is a by-product of the biocide of natural predators by pesticides in their prey, thereby enabling exploding populations of previously minor pests.

Non-point effluents & emissions tend to combine & intermingle, conducing to general ambient noise or pollution (eg urban smog, atmospheric CO_2, ozone depletion in the stratosphere, eutrophication or salination or acidification of lakes & rivers). Whilst it is possible by scientific instrumentation to measure the concentration of stipulated compounds (and hence smells) in the air[127], it is not necessarily practicable to trace & quantify the myriad sources contributing thereto.

Often non-point pollution actually does emanate from a point, but due the dispersal of those points (eg scattered homes and farms), or the sporadic infrequency of the exposure (eg domestic painting), or the mobility of the source (e.g. vehicles, ships & planes) continuous specific monitoring is not feasible. Such pollution includes many exhausts, lubricants, detergents, paints, papers, fertilizers, pesticides, herbicides & germicides. Whilst the diversity of end-applications prevents such emissions being directly monitored or recovered, their quantum is known and imposition of EIEPs on their fuel or known decibel level (eg of a plane upon takeoff) provides a reasonable surrogate.

(ii) Peculiar Difficulties of Non-Point Pollution

Non-point pollution can be inhibited by controlling or taxing its causative surrogates[128]. A clear

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[127] *Bulletin of the Swedish Water and Air Pollution Research Laboratory* Vol. 1 No. 1. 1972

[128] See "Nonpoint Pollution: Tractable Solutions to Intractable Problems" by Mason Gaffney; Paper delivered at

example is phosphate or nitrogen pollution in a river (such as pervades the vast Australian Murray-Darling basin, spawning blue-green algae and poisoning entire river-systems). It may clearly come from fertilizer applications upstream, although possibly it partially comes from a multitude of small emissions from domestic pipes. It would not be fair to impose a blanket impost at point of retail sale upon all distributions of fertilizer or detergent, given that some farmers may apply it very carefully and have constructed run-off bunds etc., or that some homes may have very effective & well-maintained septic & biocycle systems. Given the areas & the metering complexities, it would it be impossible to monitor & measure every application & runoff of fertilizer or investigate every waste-water pipe possibly leaching into the river.

Thus, instead of attempting to trace the specific point or points of a broadscale problem (eg eutrophication of the Darling River), the specific agents causing same (ie fertilizers & detergents) can be addressed, relatively cost-efficiently, at point of manufacture or sale.

This is difficult to do fairly, because surrogates far distant from the pollution -- indeed, anywhere in the catchment -- may be responsible. Furthermore, not every application of fertilizer or release of drainwater (or whatever the agent is) in the catchment may be to blame, since responsible farmers, by installation of biocycles or by construction of bunds & spreading fertilizers in wise amounts at appropriate times, may minimize or eliminate runoff. The only way to equitably manage the situation would be to levy all relevant surrogates at point of manufacture or sale everywhere in the jurisdiction (ie not merely in the catchment, lest product purchased free of the levy be imported), then grant rebates to individuals who abide by a code of practice.

This course would avoid -- as regards our example -- raising costs & lowering yields (hence forcing extension of farmlands) ubiquitously, but would involve substantial transaction costs (eg of seeking rebates and inspecting qualification), and that cost should be factored into the levy, which (like all environmental levies) should be strictly earmarked in its expenditure, not absorbed into general revenue. The cost & complexity of the bother might well encourage proper crop rotation and the growing of legumes, which is the best approach anyway.

The problem we face then is that eutrophication of a river system is simply not amenable to cleansing: the only viable purpose to which the earmarked levies can be applied (besides inspection & monitoring activity and guarding against black marketing, which would be

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Conference on "Political, Institutional and Fiscal Alternatives to Accelerate Nonpoint Pollution Programs," Milwaukee, December 9, 1987.

substantial) is towards prevention, that is, the construction of tertiary treatment plants in towns and the subsidization of farmers' biocycles & bunds. Such construction & subsidization then faces accusations of apparent unfairness, since the fertilizer-applying farmers will be contributing far more of the levies than the town family using a few litres of detergent. However, if wise tariff barriers are in place, the farmers will be able to pass the levies on (eg to purchasers of their grain) without fear of competition from imports grown by foreign farmers unconstrained by answerability for environmental externalities.

Even adopting these balancing mechanisms, however, surrogacy levies are not a complete answer to non-point pollution. A clear case of abuse is in forestry, where the cost of replanting & nurturing is avoided so long as old-growth forests (even if on steep, remote or pristine lands) remains for exploitation. The solution is to simply veto any further logging in old-growth forests, and to apply watershed run-off, visual uglification and CO_2 emission levies to subsiding reafforestation, since vegetation retains water flows and is beautiful, and photosynthesis enables carbon uptake & wood growth thereby facilitating a major sequestration of the Greenhouse gas cycle.

(iii) Carbon Sequestration

One specific form of non-point pollution is so important as to require specific comment. About 6.0bn ± 0.5 billion tonnes of carbon are released from fossil fuels into the atmosphere annually by human activity[129], and burning of vegetation probably adds another 1.5 billion tonnes. The global carbon cycle can absorb CO_2 into the oceanic depths or transform it (via vegetative photosynthesis) into wood or even coal, but of the 7-8 billion tonnes released annually, some 3.4 billion ± 0.2 billion tonnes accumulates in the atmosphere annually. This accumulation is exacerbated by the destruction of vegetation and may become rampant if deterioration of the ozone layer allows ultraviolet rays to kill plankton.

It is a “red herring” to distract the seriousness of this impact (0.3^{o}C per decade) by pointing out that changes to earth’s climate have occurred (at a gradual rate of 0.04^{o}C per decade) in the past. It is necessary to reduce CO_2 emissions by 60%, NO_2 & CFC emissions by some 80% and methane emissions by 20% in order to stabilize greenhouse gases at current levels[130]. Growth of the nuclear power industry has been curtailed because of the massive inherent dangers of accident and because the high capital costs of construction, monitoring & waste control have made the end product

[129] Ibid. p. 9

expensive. However, regardless of the viability of nuclear energy, were the fossil fuel industry to properly account for its externalities its economic viability would be very different.

In compliance with Australia's reporting obligations[131], a methodology is being developed[132] for the extremely complicated task of estimating national greenhouse emissions & sinks (uptakes) for CO_2, but considerable uncertainties are involved. Huge amounts of carbon are removed from the atmosphere (and incorporated into leaf, wood etc.) by vegetative photosynthesis, only to be emitted again via organic decay & in the breath of animals. The carbon content of the average US forest is 80 tons per acre, a US ton being 2000 pounds (ie 906 kg), which translates to 72,480 kg per acre or 29,354 kg per ha.[133]. This flux is under a natural balance, which is currently being greatly disturbed combustion of fossil fuel and broadscale clearance of vegetation.[134] Indeed, creation of excessive CO_2 actually acts as an atmospheric fertilizer and resultant sequestration is likely to be significant[135].

At least 82% of the weight of fossil fuels is carbon. One litre of petrol weighs on average 0.74 kg, 85% of which (0.63 kg) is carbon and 15% hydrogen. Upon combustion the carbon & hydrogen molecules combine with atmospheric oxygen burning some 10 kg of air (which weighs 1.2 kg per cubic metre) to release (*inter alia*, along with some carbon monoxide & nitrous oxide) 2.1 kg of CO_2. One billion tons of fuel carbon converts to 3.67 billion tons of CO_2. Carbon emission factors in kg C/GJ are 20.0 for crude oil and 25.8 for bituminous coal; 1 ton of oil equivalent is about 41.87 GJ and 1 ton of coal equivalent is about 29.31 GJ[136]. The burning of coal (usually in power stations of a mere 30-35% efficiency) involves a similar equation, with 0.35 tonnes of good quality coal being required per 1 Mw/h, such producing 870 kg of CO_2.

A survey[137] of anticipated international carbon sequestration to year 2000 shows that most countries expect a substantial net sequestration from land use change & forestry taken alone. In the USA, 1990 vegetative sequestration of 476,710,000 tonnes is expected to become 5339,049,000 tonnes by 2000. By way of disgraceful contrast, land use change & forestry in Australia (read: land-clearing) actually contributed (rather than sequestrated!) 130,843,000 tonnes in 1990, and little improvement at 121,992,000 tonnes is expected by 2000.

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130 IIPC Scientific Assessment of Climate Change, 1992

131 Under the United Nations Framework Convention on Climate Change

132 By the National Greenhouse Gas Inventory Committee, under the administration of the Department of Arts, Sport, Environment & Territories, with ongoing reports for various sectors contained in various Workbooks (May, 1996)

133 Office of Technology Assessment. 1993. "Forests". Chapter 6 in *Preparing for an Uncertain Climate* - Volume 2. Washington, DC: USGPO: 383 pp

134 Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks, Land Use Change and Forestry, Workbook for Carbon Dioxide from the Biosphere, National Greenhouse Gas Inventory Committee, Workbook 4.1 1996, Canberra

135 Gifford, R. 'Implications of CO_2 effects on vegetation for the global carbon budget' in *The Global Carbon Cycle*, M. Heinemann ed., 1994.

136 Nakicenovic, Nebojsa et al. 1995. "Energy Primer" Part I, Chapter B in "Climate Change 1995: Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses." Cambridge, UK: Cambridge University Press: 878 pp.

137 At Internet http://solstice.crest.org

It is estimated that some 5 million hectares of Australia (3m of it in Queensland) was cleared for agricultural purposes during the decade to 1993[138]. Most of this would have been burnt on-site, some off-site (as firewood), and say 10% chipped or rotted on site, releasing its carbon over a decade. Ignoring bushfires (forests affected by which are presumed to eventually take up what they release), it is estimated that the total carbon released from vegetation clearance (less uptake in regrowth, pastures etc. at known rates of 0.13-2.04% biomass p.a.) in Australia during this decade was some 152,062,000 tonnes per annum. Add to this estimated CO_2 emissions from burning of fossil fuels, both by transport and stationary (eg electricity generation) sources, @ 262,000,000 tonnes p.a.[139], indicates a total gross Australian artificial CO_2 release of 414,631,000 tonnes per annum.

Active steps are being taken under the 'one billion trees' program commenced in 1989 to reforest some 40,000 ha per annum. of land by 2000 AD, and growth of that plantation is estimated to uptake 3m. tonnes p.a.[140]. One ha. of new-growth forest can thus be expected to uptake 75 tonnes of CO_2 per annum. This indicates the need to plant, on a one-off basis, at least 5.5m ha of forest in Australia (area 770m ha) alone to enable uptake of current CO_2 emissions. Against such a scale, the planned 40,000 hectares per annum until 2000 AD is puny. Further substantial areas -- say 500,000 ha per annum -- should then be planted annually to maintain adequate stocks of new-growth uptake and to allow for logging of maturing plantations. Extrapolating globally, if the 8 billion tonnes of CO_2 released annually by human activity were to be deliberately sequestered without freeloading on oceanic cleansing then some 100m hectares of forest should be planted on a one-off basis (upon a total land mass of 13bn hectares): with oceanic freeloading, half that area.

The cost of planting useful forest and managing same to useful maturity (say at 40 years for hardwood, 10 years for softwood) varies considerably depending on the fertility, terrain & climate involved. The costs of active planting can indeed be avoided in many districts simply by removing grazing beats (for a few years at least) and allowing natural regeneration. Realistic levies to be imposed upon various types of fuel, according to their carbon content, can thus be fixed with a reasonable degree of scientific accuracy.

An initial proposal by Commission of European Communities to curb carbon dioxide emissions by imposition of a levy is at present stalling, stillborn, in the face of public & industrial outcry, lest

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138 Ibid., p. 12

139 Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks, Fuel Combustion Activities Workbook 1.1 National Greenhouse Gas Inventory Committee, Canberra (1996), p.45.

competition be disadvantaged and low income earners lose consumption capacity. Following vociferous industry opposition (particularly from coal producers) aroused in 1994 when the federal Environment Minister floated the concept of a carbon levy, the current Australian climate policy[141] is a tame political expediency which cautiously maintains the *status quo* and expressly avoids inflicting economic burdens on any contributing sector or regional area. It imposes no timeframes or targets reduction of greenhouse gas emissions and only contributes token funds to relatively small and fragmented new initiatives, envisaging instead that a gradual change (at best) will take place and that extensive measures should be planned (varying across regions) to assist adaptation to climate change.

(f) Assessment of EIEPS for Renewable Resource Extraction

(i) Introductory

Many planetary resources are capable of indefinite exploitation so long as they are wisely conserved. These resources include the atmosphere & stratosphere, plantation foodstuffs, ocean fisheries, millable timber, inland waterways. However, the longevity & even existence of these resources is threatened by abusive over-exploitation of the resources themselves and by extraneous impacts from afar (eg death of forests die to acid rain or toxic algal bloom in inland waterways due to nutrient discharge). Erosion & salination have destroyed much of Earth's farmland this century. Over-fishing (especially by drift-netting) have placed north Atlantic fish-stocks under threat of extinction and threaten to do likewise in the Pacific.

Anticipatory policies & economic incentives for management of renewable natural resources must be emplaced if species' rights are to be recognized, "non-economic" spiritual recreational educational etc. values are to be supported, irreversible harm is to be avoided and these resources are to be viably retained for future generations. However such emplacement tends to be contrary to the short-term interests of elected governments

(ii) Valuation of a Renewable Resource

The component values of a renewable resource (timber, wild fish etc.) are [a] its commercial & recreational use, [b] its value to future users and [c] its existence value. So long as [b] and [c] are ignored, commercial exploitation will impact the resource right up to the time when harvesting costs make doing so unprofitable.

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140 Ibid., p.31

141 Australia has developed a first phase National Greenhouse Response Strategy together with the addendum to the

Exploitation of renewable resources is essential, but safe minimal standards ["**SMS**"] levels of each must be set by independent authorities upon scientific bases and preserved. Only the excess above this (the maximum sustainable yield ["**MSY**"]) should be available for harvesting. Bearing in mind the possibility of unexpected impact, it is unwise to regularly harvest the MSY, and safer to fix an Optimum Sustainable Yield ["**OSY**"] at a reduced rate. Resource regeneration may be impossible but is often prohibitively expensive: prevention is better than cure. The existence value of a species is only protected by limiting exploitation to set quotas so as to maintain its 'Safe Minimum Stock' ["**SMS**"], thereby keeping future choices open and maintaining option values. Allied with SMS quotas are subsidies *not* to farm or exploit sites or stocks[142], but these presume the existence of some right in the exploiter to maintain his operation regardless of environmental impacts and such a right, whilst a feature of traditional common law, has no place (other than at the level of personal non-market subsistence) in the modern world.

SMS & hence MSY & OSY must be conservatively & scientifically set from a long-term perspective (ie centuries if not millennia -- unlike the limited planning horizon motivating most users). Monitoring of stock levels must be multi-disciplinary. Entry into critical zones (i.e. below SMS), let alone descent into calculating the ramifications of consciously destroying or decimating a specific stock (eg bluefin tuna), must be avoided with horror. Even this sober approach to maintaining the resource-base is fraught with dangers, since the variables & lead-times occasioned by environmental impacts can be complicated, concealed & long-delayed (eg ozonization, 1988 monk-seal collapse). It is essential to monitor continuously, heed early warning signs, enable rigorous imposition of harvesting constraints and prepare potent anticipatory mechanisms for "surprise" management. An error in the calculation of MSY, or perhaps a surprise event such as an increase in the El Nino effect, can collapse a resource (eg Peruvian anchovies).

Having arrived at the OSY of each species, in each appropriate zone, etc., available for tender or auction, the authority can usually, in safety, leave bidding to market competition. It is impossible to quantify or factor in existence & bequest values, and these should be treated as adequately served by maintenance of SMS. There is no need for the authority to conduct complicated economic studies into the profitability of the harvesting: free market operators will do that themselves. Nor need the authority attempt to compile cost-benefit equations accounting for the vague & diverse ramifications of employment-generation and downstream resource-reliance which the harvesting services: those who benefit indirectly or at second-hand from the harvesting will occupy factories,

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Strategy Greenhouse 21C: A Plan of Action for a Sustainable Future, released in April, 1995.

[142] As under the *United Kingdom Wildlife and Countryside Act* (UK, 1981).

shops, homes etc. to which appropriate locational values will adhere, and they will contribute in their own way to the global economy via Site Revenue.

#5(g) Assessment of EIEPS for Non-Renewable Resource Extraction

(i) Introductory

Whilst new discoveries (even major ones) are made from time to time, and potentials exist for exploitation in more difficult & dangerous arenas (eg on ocean floor or Antarctica), the available scientific evidence is that planetary reserves of exploitable mineral & fossil resources are strictly limited[143]. All existing supplies belong to the globe as a whole, not to their finders nor their national governments, and those resources must be held in trust at all times with a perspective of at least one millennium. It is irresponsible & unethical, from the point of view of intergenerational equity, to permit extraction of non-renewable resources without rationing.

The permitted annual ration of each resource available for extraction should be publicly auctioned, or made available for tender. Strict conditions, covering regeneration etc., should be applied to all quotas sold. Half the proceeds should be held in trust and applied solely to the benefit of non-domestic fauna. The other half should be applied to administrative & research costs and thereafter to human charities.

(ii) Auctioning Quotas for Non-Renewable Resource Extraction

As regards the extraction of non-renewable resources, responsible authorities have much the same obligation to observe intergenerational equity as do their equivalents in the area of renewable resources, but of course in their case there is no known way to replace that which has been extracted. Accordingly, an appropriate, long-term budget must be adopted, and planning (as regards the exploitation & use of limited known stocks) should proceed (continually, with fresh reassessment at least every 10 years) upon a 1000-year basis. Thus, if known stocks of a non-renewable resource (eg copper or iron ore mineralization) is x tonnes and the quantum of demand is d, then the annual quota available for auction should be 1000^{th} of x/d. This avoids the problem of severance taxes upon exhaustible resources raising their value *in situ*, hence encouraging squatting upon known reserves and slowing depletion.

There is a need to distinguish here between valuable and common non-renewable resources. In some instances this is relatively obvious: oil, aluminium, silver etc. are in strictly limited supply, have high

economic worth and are likely to be in high demand & irreplaceable indefinitely, whilst their consumption (in engines, photography etc.) may have very restricted longevity. Other resources (eg rock, roadbase, sand, gravel) are relatively plentiful & cheap, and their extraction is likely to build a permanent material infrastructure lasting for centuries. Policy variations may be appropriate as regards rationing the former type of resource which should be reversed as regards rationing the latter type.

All existing non-operational mining rights & entitlements for 'valuable' resources should be revoked forthwith without compensation, as (without blame to the individuals involved) constituting a fraud upon the planetary trust.

All existing operational quarrying & mining rights & entitlements, being similarly tarnished, should terminate as of next 30 June, but operators (who have infrastructure in place etc.) should be granted an option to continue their operation to exhaustion of the resource upon the basis that any excess extracted above the legitimate quota will be sold to the authority at that market price prevailing now. The authority will then stockpile all the excess production (ie above the legitimate ration) for sale (by public auction) at the legal rationed rate. Once the backlog is cleared, the normal & proper process of assessing & auctioning extraction quotas, to be filled from mines approved with due priority under EIS processes etc, can resume.

Upon reporting of mineralization, etc., the responsible authority would roughly prioritize the resource given the availability of existing mines, demand etc. Such prioritization would involve investigating the assay & extent of the deposit, difficulties of extraction (access terrain, tailings problems, depth of deposit etc.) and conduct environmental impact assessments. In all instances the EIS would be conducted by independent entities with no commercial interest in which particular deposit was selected for filling oncoming quotas.

Having selected oncoming prioritized candidate sites for resource extraction, the authority would make public all its data and facilitate bidders performing their own research at their leisure. Partly by its own assessment, partly by negotiation with those potential bidders, the authority would decide what period of lease term (1, 5, 10 or 20 years etc.) was most appropriate to be offered for tender or auctioned. Extension to the term should be negotiable if there has been proven performance and good reason. There are difficulties in having regular (say annual) fresh auctions of the mining rights due to the cost of the private infrastructure in place. If company A put in $1m of infrastructure but in year 3 was outbid on royalties by company B, major problems of equity & efficiency would arise.

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[143] See above, section 2(b)(ii).

The right to mine the ore body, over the appropriate term, would then be publicly auctioned. The conditions attaching to the mining (dust, noise, times of operation, rehabilitation, bonds etc.) would be set in advance, and bidding would be as to (a) a lump sum (b) the first year's base rent and (c) the royalty. There is no fee other than the lump sum, the annual rental and the royalty: these comprise the mine's Site Revenue.

The lump sum should be adequate to pay the finder, the Authority's researches and the cost of the auction. The base rent is in place to ensure at least nominal effort compared to other competitive uses of the land. Thus, if the land would otherwise have been rural, worth $10,000 pa., and the ugliness & dust of the mine is estimated to have a downside of $190,000 pa as regards the annual rental value of affected neighbours, then the auctioneer's reserve on the base rent would be set at $200,000. The base rent is geared to cover losses on normal site revenue which would have flowed from the locality, and as such should be paid into general revenue. The first year's base rent would thereafter be indexed to inflation and/or the valuer's calculations of its downside as regards other rentals thereby lost. It is in the interest of the community that the mining be finalized & rehabilitated within the term. If the resource price collapsed, eg because a massive high grade deposit was located elsewhere or because a new material (say fibre optic) replaced an old one (say copper) then the mining rights could be surrendered, subject to rehabilitation or loss of bond.

The royalty would be set pcm of ore extracted by processing and would be a matter for open bidding. The bid successful bid should be benchmarked against the global price for the refined ore at that time, and in each subsequent year the royalty bid should be adjusted up or down in proportion to movements in the resource price. The royalty, being a private payment for the right to extract & profit from a public (God-given) non-renewable resource, would, under triangulation, be payable entirely into trust for the protection & enhancement of nature[144].

(iii) Finder's Fees

If any competitive market tendering or auction system is to work, mere finders of non-renewable resources should have no prior right to exploit them. They should, no doubt, be entitled to some reward & encouragement, but the finder's fee must be separated from the resource rental.

Having located & proven a find, a finder should report all its data to the relevant authority. That authority would then, no doubt, conduct its own proving tests, aided by those of the finder. If the

[144] See below, section 5(h).

finder had done a good job, the authority would pay him for all proven disbursements (including labour costs) plus a suitable (market-related) bonus for initiative in a risky business (where only a percentage of prospects may locate paydirt).

The finder would have no specific rights to mine the ore body, however on the basis of the public data now available, competitive mining companies could do their sums and ascertain likely infrastructural, rehabilitation etc costs and the likely mining period (ie term to exhaust the deposit).

(h) Earmarking of EIEP Revenue

Rental paid in respect of ***each form of pollution*** should be applied strictly towards, and should -- to the extent that is humanly possible -- be applied to abatement programs and totally pay for neutralizing its impact. Thus, rental paid in respect of airspace occupied by CO_2 must be ear-tagged for the preservation, improvement & protection of tree cover, and charges paid in respect of sewage paid to its tertiary treatment. With effluent anyway, this has in fact been the typical European approach[145]. Earmarking of externality taxes on a vast range of complex pollutants from fertilizers & CO_2 through PVC, PCB & DDT to radioactive wastes, so as to require their application to healing downsides (rather than to swell general revenue) makes them more palatable to the community and indeed to polluters themselves.

It should be noted that collecting & ear-tagging the "pollution rental" is not a tax at all, but rather the recovery by the community (indeed by the entire global commons) from the polluter of the economic value destroyed by its activity. This rental corrects a resource misallocation and in no way (unlike most taxes) warps allocative efficiency. If the revenue so-raised is devoted to this purpose then zero intergenerational or inter-species impacts result and the price mechanism is bound to adjust until Pareto-efficiency is reached. This solution also avoids all the problems of allotting, valuing & policing transferable pollution rights.

As a ramification of triangulation[146], the dollar values bid by humans for the right ***to extract natural resources*** must be held entirely on trust for Nature. Humanity has its full entitlement in the form of the goods created from those raw resources, and the employment such process involves. The capital value of the raw resources are not, and never could be, the property of humanity. Despite this, Nature is ever-generous. Half of public revenue derived from grant or rights to exploit non-renewable resources must be held in trust for the benefit of natural species. In part this would be

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[145] W.J. Baumol & W.E. Oates *Economics, Environmental Policy and Quality of Life* (Prentice-Hall, New Jersey, 1979) p.357.

[146] See section 2(f) above.

applied to research, veterinary care etc., but the vast bulk would be applied to maintain & preserve extensive national parks and to pay bounties to landowners who, at commercial sacrifice, preserve habitat for natural species. However, without prejudice to the rights of Nature as beneficiary entitled, it would be appropriate for the other half of such trust fund, for the time being, to be applied to supply permacultural infrastructure to the neediest peoples of the globe. In no instance should any of the trust fund to be paid into national or international general revenue.

#6. CONCLUSION

Neoclassical economics was manufactured by, or on behalf of, an imperialist elite which quite deliberately disregarded the valid & vital interests of the developing world and of Nature. As a result, markets and patterns of production & consumption which are dangerously destructive of the environment and discount intergenerational equity, have become dominant and even threaten human survival on earth.

Sanity & balance can only be restored by adopting (on a global basis) Site Revenue as the sole source of public finance, and by recognizing that humanity & Nature coexist as equal partners. Due to the massive externalities imposed by human industry, appropriate economic instruments must, as aspects of the Site Revenue system, be imposed to remediate all pollution and to collect the economic value of non-renewable resources extracted, under a strict rationing scheme, such proceeds to be held on trust strictly for Nature as sole beneficiary.

The only way for humanity to survive upon this planet, whilst observing decent international & intergenerational equity and environmental sustainability, is by adoption of a low-impact, low-demand lifestyle with Site Revenue as the sole source of public finance. This need not, however, derogate from quality of life: far from it.

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