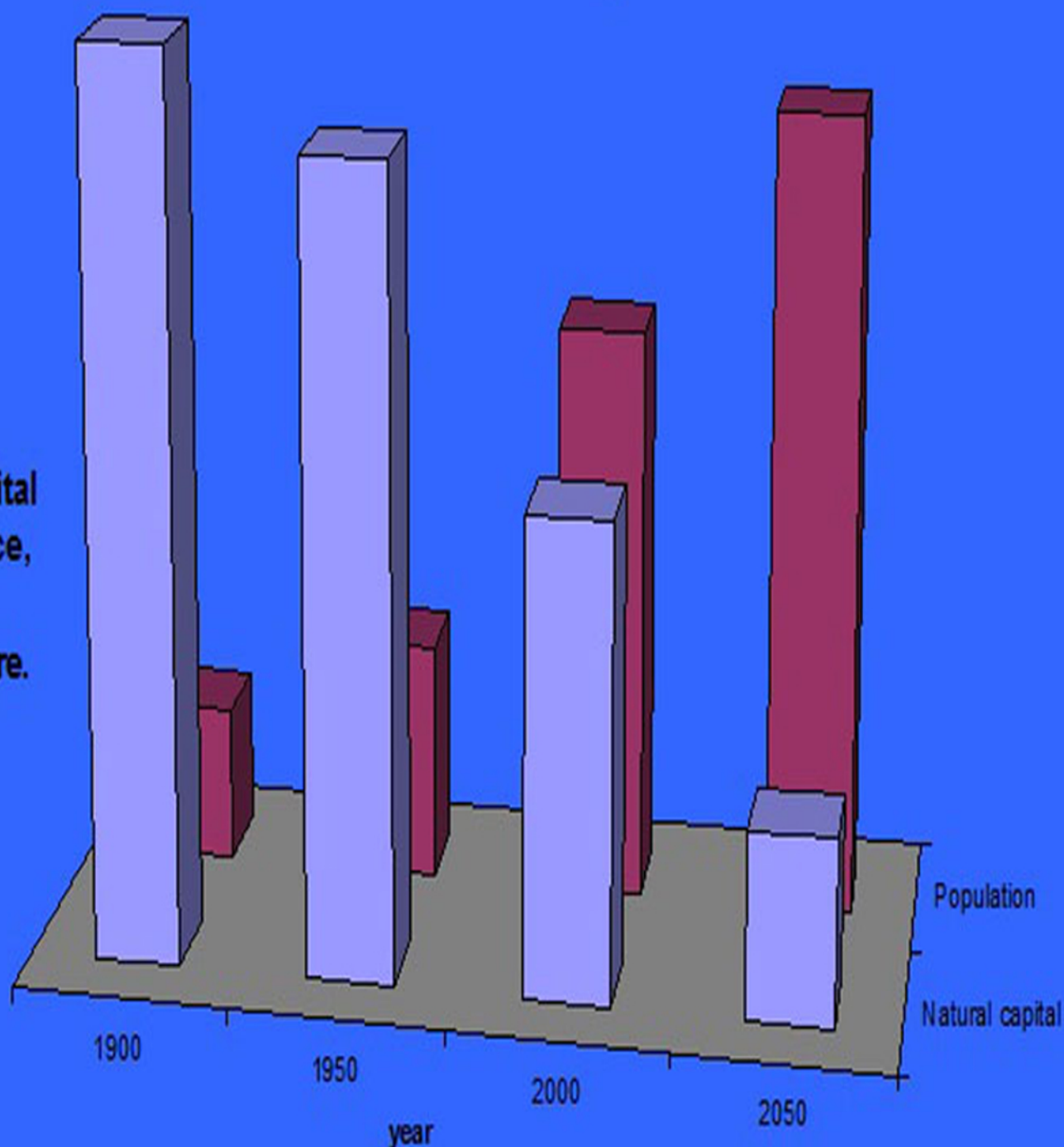


Gaia and Tityas

What Homo sapiens have done

They have used
Gaia's natural capital
to build their edifice,
Tityas, without
caring for the future.



Denis Frith

An Australian ecological realist

Gaia and Tityas

What Homo sapiens has done

By

Denis Frith



Strategic Book Group

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Strategic Book Group
P.O. Box 333
Durham, CT 06422
www.StrategicBookClub.com

ISBN: 978-1-60976-987-1

Printed in the United States of America

E-Book Design: Roger Hayes

Table of Contents

Industrial civilization's Pandora's Box	3
Going, going, gone	4
The Usufruct Delusion	9
Summary	9
The Holistic Scenario	9
The Questions.....	12
What has happened.....	15
The predicaments	19
The treatment.....	28
<i>e.greed</i> pandemic	29
The Homo sapiens dream in stark reality.....	30
The demise of Tityas	35
The way ahead.....	39
Introduction	39
Some concerns.....	41
Prognosis	44
Your path.....	46
Australian perspective	47
Coping	49
Perspective	54
A question	67
Conclusion.....	70

Industrial civilization's Pandora's Box

In Greek mythology, Pandora was the first woman. Each god helped create her by giving her unique gifts. Zeus ordered her creation as a punishment for mankind, in retaliation for Prometheus' having stolen fire and then giving it to humans for their use. She is most famous for carrying a jar (or box) containing all the world's evils. She releases these evils, and tries to close the lid but it was too late. Along with these evils came Hope, Humanity's only salvation .

It is ironical that the inventiveness and capabilities of modern man enabled the extraction of the exhaustible fossil fuels from the crustal store to provide the energy to drive the development of industrial civilization also enabled the production of the material wastes that is driving climate change. This energy has been industrial civilization's equivalent of the fire stolen by Prometheus. Greenhouse gas emissions, with the devastation of the environment and other malfeasances, have been the 'evils' let out of the box. Hope did not get out, for good reason.

So modern man has made the grievous mistake of extracting billions of tonnes of carbon from the crustal store and expelling it into the atmosphere and the oceans. The onset of climate change is just one consequence of that malfeasance. That damage has been done. There is no turning back the clock. Society glorifies the civilization that has been built by irreversibly using the limited natural bounty but loses sight of the inability to sustain this exuberance. They do not understand what is irreversible even though their lives go down that path!

Now society has to cope with the senescence of civilization while having little understanding of what went wrong.

Going, going, gone

The day-by-day materialistic operation of civilization, Tityas, entails the consumption primarily of INMR (irreplaceable natural material resources – natural capital) together with some RNMR (replenishable natural material resources – natural income) at a high rate. This consumption includes meeting the needs and wants of the populace of Tityas for goods and services. It also includes what is required to operate and maintain the systems, such as cities, of this massive civilization. These operations invariably entail the irreversible dissipation of energy and the production of material wastes. A coal-fired power station generating electricity is an example. It means, in the case of the INMR components, a consequential reduction in the estimated balance remaining of those used in the operation. Oil is only one of the many components though its depletion is causing appreciable concern. The loss of topsoil does not get the same publicity but its impact could be devastating for many of the under fed global population in the near future. There is generally appreciable uncertainty about the available balance of components but the principle still applies that the stock of the component is irrevocably reducing. The following assessment is primarily concerned with this depletion of INMR. The continuing usage of RNMR is taken for granted. INMR is going and will be gone in the future. You need to put your thinking cap on! Conventional thinking is about the benefits of the systems of Tityas using INMR to do useful things for society. This assessment is about the consequential unsustainable destruction of natural material wealth. It is looking at the other side of the ledger.

INMR is becoming scarce because there is a limit to what can ultimately be used. Tityas in its present form is not sustainable because it uses INMR for its operation and maintenance. There is a commitment to use INMR for what is already in place yet this irreplaceable natural resource is running out. The operation of Tityas will have to power down as the possible rate of usage of INMR declines. The challenge to be faced by society is how best to use the remaining INMR as Tityas and its population contract to running primarily on RNMR.

The objective of the International Professors Project Google Group ‘Senescence of civilization’ is to develop a spreadsheet that constitutes a sound, transparent tool to aid the widespread assessment of the wisest use of the remaining INMR. The intention is that it should assist countries and communities in deciding how best to meet the needs of their populace and of their systems as they power down.

This objective will be assisted by having available an updateable list of INMR components, their location, their mode of usage, worthwhile recycling of materials, prospective alternatives, estimated limit, current rate of usage and expected time until a critical shortage. This list needs to be reputable and handled by a body such as the United Nations. It would complement the Millennium Development Goals (MDGs). Entries will vary according to the location of the source of the INMR and where it is being used.

Much of this data already exists even though it often has noise because it is tainted by vested interests. However, the holistic view will help governments to adopt policies that will aid its most worthwhile short-term and long-term usage. It will also help business people to assess opportunities, partly because it encourages more realistic financial costing by taking into account divestment of natural material wealth, INMR. It will encourage a population contraction by humanitarian means. It will also encourage the populace to use RNMR by doing rather than consuming INMR, so aiding conversion towards a sustainable economy.

The list would need to be formulated in such a manner as to indicate the relative contribution of each component to the holistic measure. Many people argue that market forces are the most efficient means of making use of resources. That is a farcical argument for two reasons. Financial costing is pointless as many components of INMR are currently regarded as being free. Mining companies in Australia pay only a nominal royalty for using the iron-ore, coal, uranium and natural gas that constitute an appreciable proportion of its natural material wealth. They pay a healthy dividend but do not appear to make allowance for their dependence on cheap fuels that is bound to end soon. Global soil fertility has been drastically eroded by forms of malpractice without the consequences being taken into account even now. Secondly, countries that are rich by virtue of prior plundering of INMR have the leverage to maintain their marauding at the expense of poor countries and the future. A pragmatic objective would be the reduction of the per capita consumption of INMR by the advantaged and an increase by the disadvantaged. A realistic measure of the INMR available in the various regions would help in the attainment of that objective. However, it is probably unrealizable given the current discrepancy, the outlook of the powerful and the helplessness of the poor.

The amount of a resource remaining under ground is also a misleading measure. Oil is most likely to become scarce before coal but there are sound reasons to discourage a high rate of usage of this dirty fuel. There would be some logic in rating some items so that they will become very scarce about the same time. That however, does not take into account the current rate of usage of the item and the established commitment to use it in the future. Looming shortages of precious metals such as platinum, palladium and rhodium will limit the future use of catalytic converters to reduce the emissions from car engines. Shortages of rare earth minerals are likely to heavily impact the information revolution to the consternation of the global rising generation. However, the declining soil fertility will sadly have a more profound influence on the hungry millions.

I expect that there are a number of sources of information and data relevant to the entries in the INMR list. I have noted an appreciable amount but it has not yet been consolidated for use here. For example, Table 4 Nonrenewable Natural Resources in the Club of Rome book, *Limits to Growth* contains some relevant information. I have put a tentative list here to encourage discussion but I expect that existing, more comprehensive lists will emerge. Many items are missing from the list below because the necessary research has not been carried out. There could well exist sites that already have the mechanism discussed above. Some of the items below would also appear on an RNMR list because the goods and services they provide are naturally replenished. 'forests' can be INMR in

some regions because de-forestation is so rampant while being predominantly RNMR in other regions because they are managed in a sustainable fashion. 'rivers' are included in INMR where the services they used to provide have been degraded by the operations of civilization. Most of the major global rivers have been so affected, with pollution by toxic wastes being only one of the problems. The fossil fuels would have to be rated on their contribution to climate change. The estimates in the INMR are for the degradation part of the impact only. A separate RNMR list could help to provide perspective of the holistic scene where there is natural replenishment of what has been used. The hydrological cycle ensures precipitation but the greenhouse gas emissions from fossil fuel combustion is causing both increases, leading to flooding, and decreases in droughts.

INMR components:

- Raw materials
- Sources of energy
 - Oil
 - Coal
 - Natural gas
 - Uranium, thorium

 - Geo thermal
 - Hydro
 - Bio-mass
 - Solar thermal
 - Wind turbines
 - Photo voltaic
 - Tidal
 - Wave machines
 - Ocean energy harnessing
- Construction metals
 - Iron-ore: steel
 - Bauxite: aluminum
 - Copper
 - Lead
 - Nickel
 - Tin
 - Zinc
- Materials for goods
 - Chromium
 - Cobalt
 - Manganese
 - Mercury
 - Molybdenum
 - Silver
 - Tungsten
 - Platinum

- Palladium
- Rhodium
- Radium
- Rare earth minerals
- Silicon
- Lithium
- Sources of materials for agriculture
- Aquifer water
- Carbon
- Nutrients
- Phosphorus
- Sources of materials for chemical compounds
 - Sodium compounds
 - Potassium compounds
 - Chlorides
 - Salt
 - Sulphur
- Natural resources
- Water resources
 - Aquifers
 - Rivers
 - Lakes
 - Snow melt
 - Precipitation
 - Oceans
- Land resources
 - Arable land
 - Topsoil
 - Soil fertility
 - Forests
 - Deserts
 - Mountains
 - Rivers
- Ocean resources
 - Fisheries
 - Currents
- Atmospheric resources
 - Monsoons
 - La nina
 - El nino
 - Roaring forties winds

Of course, this proposal for an INMR list is quite nonsensical. It would entail an appreciable amount of work by dedicated people and take some time to put in place. It could then become a sound statement on the situation with respect to what remains of the multitude of natural material items that are depleting rapidly. It would be a useful basis for sound decisions. However, who would use it? The powerful elite with the leverage of money may show some desultory signs but back little real action. They will be virtually immune to the crumbling of the foundations of Tityas. They will, as ever, expend their intellectual energy in manipulating the money-markets to garner the rewards and socialize the costs. On the other hand, the disadvantaged billions will be unaware of the implications of this stark reality as they vainly strive to improve their standard of living. There will be a small, smart middle class who press for a rational policy as the symptoms of the holistic malaise become more apparent. They will be ineffectual as urbanized society disintegrates in bewilderment as to what went wrong. They had never been given reason to think about their right to devastate their life support system. Acquisition of money was supposed to be the gospel. The technofix was meant to solve all problems. Homo sapiens were the omnipotent species. Now they have to learn that their prop, INMR, is nearly all gone! The reduced population will have to dependent mainly on RNMR but Tityas will crumble through lack of energy and materials for maintenance.

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