

CLUB OF ROME - MINERALS ARMAGEDDON

The next Green campaign against Industrialisation and Man was based on the work of a group called 'The Club of Rome'. The Club of Rome was created in April 1968 by Aurelio Peccei, an Italian industrialist, and Alexander King, a Scottish scientist. A small international group of people from the fields of academia, civil society, diplomacy, and industry, first met at a villa in Rome, Italy, leading to the Club's name. This **political** organisation has the following 'essential' mission¹:

"to act as a global catalyst for change through the identification and analysis of the crucial problems facing humanity and the communication of such problems to the most important public and private decision makers as well as to the general public."

Although the Club claims it is "independent of any political, ideological or religious interests"², a visit to its web site will reveal yet another Green organisation. The Club raised considerable public attention in 1972 with its report *The Limits to Growth*³. The report modelled the consequences of a rapidly growing world population and finite resource supplies. Its authors were Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, and William W. Behrens III. The report's tone was a modern version of the concerns, and failed predictions, of the Reverend Thomas Robert Malthus in "*An Essay on the Principle of Population*" (1798).

This handout focuses on the report's predictions about mineral resource depletion.

THE LIMITS TO GROWTH

The report described a Minerals Armageddon caused by 'uncontrollable growth' and predicted that the World would run out of minerals within fifteen years and petroleum by 1992. How good were these predictions?

Were the Greens right? No. Were the Greens nearly right? No. Did the Greens get anything right? No. Even when the report significantly underestimated the actual consumption rates of these minerals, at no time⁴ in the Report's predicted 15-year timeframe did consumption significantly reduce the proven resource levels, let alone go close to exhausting the supply of the minerals.

Table 1 looks at reserves of minerals, over a longer time-frame (i.e. 1950-2000)⁷ rather than the Report's timeframe 1970-1985), with the intention of showing the prediction failures of this "international intellectual body of experts". The 1970 column in Table 1 shows the reserves the Club considered in its Report.

There are several parallels between the Club of Rome and the more modern Intergovernmental Panel on Climate Change (IPCC):

1. Both are high on status, yet poor on results,
2. Both are political, yet appeal to authority (i.e. we are intellectuals [The Club], we are scientists [IPCC].) to convince the people that their work is sound and not political.
3. Both have used models with unsound underlying assumptions, which I believe have been chosen for ideological, rather than rational reasons.
4. Both have made predictions with long timeframes which have proved to be so wrong that it is hard to understand how they achieved such a result.

Table 1 - Proven Mineral resources, 1950 – 2000 (in Millions of Metric Tons)

Resource	1950 ⁵	1970 ⁵	2000 ⁶	1950-2000 Change (%)
Bauxite	1,400	1,170	25,000	1,786%
Chromium	70		3,600	5,143%
Copper	100	308	340	340%
Iron Ore	19,000		140,000	737%
Lead	40	91	64 ⁴	160%
Manganese	500		660	132%
Nickel	17	67	49	288%
Tin	6		9.6	160%
Zinc	70	123	190	271%

What Went Wrong?

All these Malthusian scare stories are attractive to believe, as we all understand the concept that you can exhaust a finite resource by any use, even if it takes millions of years. The fallacy we fall for is then to think that this will happen overnight. We are encouraged to make this jump by not appreciating the Earth's size, and by being arrogant enough to consider our mining industry efforts as massive when compared to the size of our Earth.

However, without arguing that point, there are several dynamics involved that undermine the simple non-dynamic view on which most of these stories are based. In their simplest form, those perpetrating these scare campaigns do their best to estimate the resources left in the world and then divide such a number with

their best estimate of an annual usage rate. In the Club of Rome's case, out pops the '15 year' answer. What is not considered is:

- How a free market works,
- The effects of alternatives
- Technology, and the
- Use of reserves.

Using Oil as an Example

If scarcity of oil doubles the price of oil, several things happen at once. Consumers will reduce their consumption as they can no longer afford to buy as much oil. This drop in demand increases the life of oil before exhaustion. If the price remains high, the consumer might change his behaviour by seeking out alternatives (e.g. catching a bus or riding a bike). Demand drops further and the life of oil is again extended. The higher price of oil will encourage several other commercial reactions.

What were expensive alternatives to oil (e.g. Electric or hybrid cars), now might become competitive, further reducing the use of oil. Even if the competitive gap is not closed completely, more research is encouraged on alternatives that will achieve this aim. On the supply side, the increased price of oil will encourage more exploration. Non-economic reserves now become economic. Such increases in supply increase the life of oil.

Just as the increased price encourages research in alternatives, there will be an increase in research on finding and recovering oil. Technological breakthroughs from such research can dramatically change this whole dynamic picture. In the early 1970s, drilling for undersea oil could not be carried out at ocean depths exceeding 200 feet. Technology has advanced, and in 2010, oil is being extracted at ocean depths greater than 5,000 feet.

One of the most fragile assumptions made in such non-dynamic views is the assumption that the reserves we have today are the total amount of any particular mineral left on the planet today. That is just pure foolishness. The unknown is unknown; so any guesses about the unknown amount of resources left on the planet is a guess, and not even an educated guess. Even a wonderful computer model cannot solve that dilemma! Tomorrow they could find the biggest mineral find the world has ever seen. When you look at how little we have scratched the surface of the Earth, let alone digging at great depth for minerals, you start to get an appreciation of how big the Earth is, and the potential for additional discoveries.

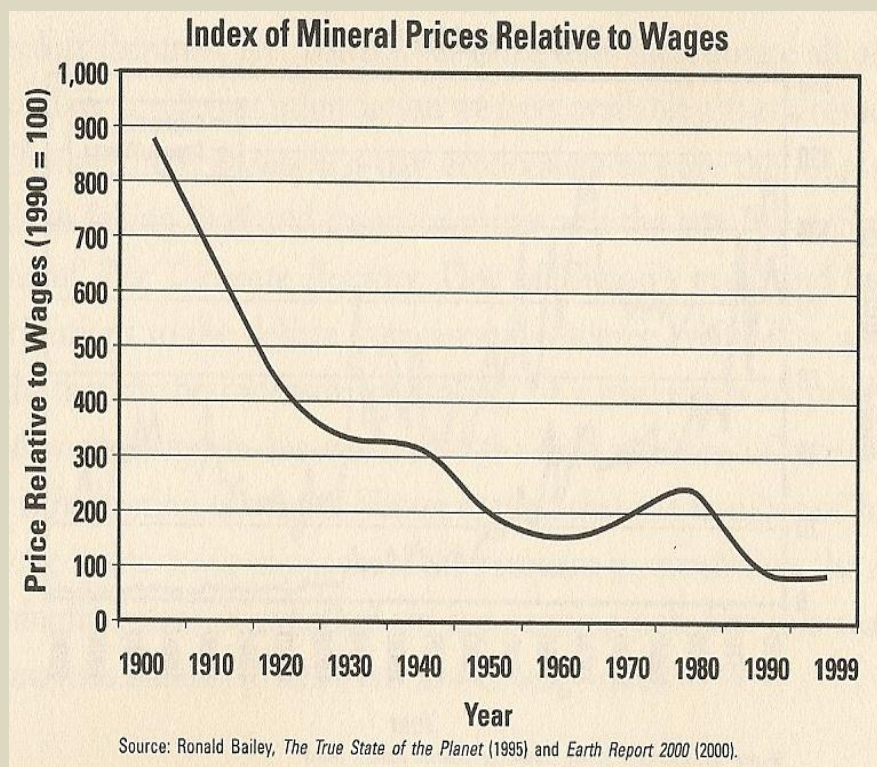
Finally, there is no commercial incentive for any company to spend very large amounts of money to find additional reserves when they already have 'adequate' reserves. Why would you waste money doing that? Some minor exploration might be undertaken to find reserves that are cheaper to recover than

the existing reserves, but the incentive in this case is not the same as exploration when reserves appear to be running out.

Are We Close to Running Out?

The best indicator we will have when resources are running out will be provided by the free market and its price signals. Any shortage in supply will drive the price of the commodity up. If demand is steady and the price of a commodity is going up, then obviously there is a supply shortage, which may be a short or a long term problem. If prices continue to rise for, say, fifty years then there may be a supply problem with that commodity. Conversely, if prices are falling in the long term, we can confidently assume we do not have a supply shortfall, and exhaustion of that particular commodity is not imminent. This is the type of signal we should be using, not educated guesses and computer model outputs from 'important Green intellectuals'.

Below is a graph of mineral prices relative to wages for the period 1900 – 1999. Most observers might agree that exhaustion of minerals is unlikely to occur in the near future.



CONCLUSION

The Minerals Armageddon campaign was yet another example of the Greens attempting to scare the population and create an emotional atmosphere in which they could achieve their political objectives. Were their predictions wrong?

Yes they were wrong. Were they very wrong? Yes they were so wrong it is unbelievable. Why should we continue to believe the Greens when they have such an appalling track record of failed predictions? If we are truly concerned about the possibility of mineral exhaustion, a novel suggestion might be to listen to the mining industry's thoughts, rather than listening to Green intellectuals.

Notes:

1. <http://www.clubofrome.org/eng/about/3/D>, Club of Rome Website, 1503, 16 June 2010
2. Ibid
3. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, and William W. Behrens III. "*The Limits to Growth*", Universe Books, New York, 1972.
4. Lead is an exception to this statement. Because lead is rarely used today when compared to its use in the 1950s, it is not surprising to see reserves drop from the 1970 figure of 91million tons to 49 million tons in the year 2000.
5. Herman Kahn, William Brown, and Leon Martel, *The Next 200 Years* (New York: William Morrow,1976), p92.
6. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, and William W. Behrens III. "*The Limits to Growth*", Universe Books, New York, 1972, p. 56-58.
7. US Geological Survey, *Mineral Commodity Summary 2001*, <http://www.minerals.usgov/minerals/pubs/mcs/2001/mcs2001.pdf>, available 2002.