ZERO CARBON BRITAIN and resource management

By Tom Barker

The accumulated pressures from extraction and use of resources, and the dumping of resource wastes after use, have reached the point where the homeostasis of the planet is thought to be at stake (Rockström et al. 2009), and the viability and security of human civilisation (Erhlich and Ehrlich 2013) and ecological diversity (Wake and Vredenburg 2008) are at risk. What has gone wrong? Why does it matter if we use up resources or pollute the atmosphere? Why cannot we keep on the way we always have done and remain safe from these external changes? The answers to these questions are the subject of a great deal of research in institutions around the world.

The Earth is a great big ball of resources for the organisms living on it. Throughout evolutionary history, species have developed and expanded their populations and ranges according to environmental conditions such as temperature, water availability and abundance of physical and chemical resources. Waste materials are processed by organisms as diverse as mammals, birds, insects, fungi and bacteria, during which they are converted to mineral forms that other organisms can use as resources. Thus, they are renewable resources in a dynamic and cyclical pattern of resource and waste material use that ensures that nothing is wasted and all available resources are fully utilised.

Over millions of years, these basic conditions for life have been tempered by competition and disease, and sometimes nearly destroyed by environmental change in the form of climate change and the odd comet or asteroid impact. Despite such interruptions, however devastating, the homeostasis of the planet has always returned after a few hundred thousand years (see e.g. Ruddiman 2001).

When humans migrated to Britain after the retreat of the Devensian ice sheet about 10,000 years ago, they found a large expanse of wild country with plenty of room to expand. Humans lived sustainably until the Industrial Revolution, when concentrated sources of power were harnessed in order to do more work than the human scale could manage. Although the immediate costs of industrialisation were recognised, they were considered essential to achieve progress, especially by those who stood to reap the profits whilst others bore the costs, but that is a different argument. There were unforeseen consequences of industrialisation, too. Toxic substances released to air, land and water caused immediate problems, but also contributed over time to the global-scale environmental predicament we find ourselves in today.

Adam Smith, the father of free-market economics, observed of a tradesperson, in ‘pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it ’. In other words, immediate profit for individuals leads to general levels of improvement in society. The purpose of capitalism is to improve well-being, and it has succeeded by lifting millions of people out of poverty. The same phenomenon can be seen in nature: as each species strives to compete and reproduce, the whole habitat becomes more fruitful. In nature, however, senescence and decay is equal in amount to growth and reproduction. The whole can continue without expansion. This is where the economy needs to learn from nature.

Robert Costanza (2008) has noted that the Industrial Revolution and the theories of Adam Smith were right for the period because the world was comparatively empty of people (there were 7.5 million people in Britain and 790 million people globally in 1750). There was room for apparently endless expansion, resources were huge and untapped, recycling seemed unnecessary, and the environment was so big that waste dumping had only local effects. Today, 250 years later, with ten times as many people, the world is full of humans and our infrastructure, and as we blithely consume resources and dump wastes, we are coming close to the limits that can be sustained without risk of planet-wide disruption to our environment (Rockström et al. 2009). We have failed to adapt our regime to a ‘full world’ (Costanza 2008).

The market economy, still the most powerful driver of change, has served its purpose as a net benefit to human society. Today's problems of poverty are to do with distribution and unequal impacts. We still believe in unlimited growth and our globalised economies are too centralised and complex. The ultimate consequences of unlimited economic growth now make it both impossible and undesirable (Beddoe et al 2009). The external impacts of the globalised market economy cause loss of ecosystem services, mass poverty, extinctions, climate change, and the global economic crash, yet governments worldwide give $2,000,000,000,000 a year in subsidies for practices that degrade the environment.

As ZCB seeks to find a workable plan to eliminate the UK's net carbon emissions to atmosphere, we must grasp the nettle of a new way of thinking. Old thinking sets aside environmental considerations, and directly leads to the problems that are poised to overwhelm society. Our worldviews, institutions and technologies all need to change to meet today's 'grand challenges' (Beddoe et al 2009). This requires a whole-system approach at multiple scales, aimed at sustainable quality of life, and maintenance and expansion of natural capital. We need to learn from nature to create a cyclical, resource-conserving and waste-conserving society as part of the transformation to a new economic and industrial way of life. We can do this using biomimetics, the circular economy (Ellen MacArthur Foundation 2012), life-cycle assessment and similar tools to emulate the balanced resource budget of natural systems. Big changes are coming to human society, whether we like it or not, so we must grasp the nettle and manage the transformation, otherwise we will be buffered by it to some chance end.

About the author:

An ecosystems scientist at The University of Liverpool, Tom studies the effects of environmental degradation on ecosystem quality, in particular ecological stabilising mechanisms and functional indicators of environmental change in lakes and wetlands. He lectures on sustainability, resource management, biodiversity and ecosystem services at Liverpool and CAT's GSE.

References

Beddoe, R.; Costanza, R.; Farley, J.; Garza, E.; Kent, J.; Kubiszewski, I.; Martinez, L.; Mccowen, T. et al.; Costanza, R; Farley, J; Garza, E; Kent, J; Kubiszewski, I; Martinez, L; Mccowen, T; Murphy, K; Myers, N; Ogden, Z; Stapleton, K; Woodward, J (Feb 2009). Overcoming systemic roadblocks to sustainability: the evolutionary redesign of worldviews, institutions, and technologies. *Proceedings of the National Academy of Sciences of the United States of America* **106**(8): 2483–2489.

Costanza R. (2008). Stewardship for a 'full' world. *Current History* **107** 30-35.

Ehrlich P.R. and Ehrlich A.H. 2013. Can a collapse of global civilization be avoided? *Proceedings of the Royal Society B*. 280, 20122845.

Rockström J., Steffen W., Noone K. et al. 2009. A safe operating space for humanity. *Nature* **461** 472-475.

Ellen MacArthur Foundation 2012. *Towards the Circular Economy. Economic and business rationale for an accelerated transition*. (www.ellenmacarthurfoundation.org/). Also see the second report (*Opportunities for the consumer goods sector*).

Ruddiman W.F. (2001). *Earth's Climate. Past and Future*. W.H. Freeman. Chapters 4, 5 & 7.

Wake D.B. and Vredenburg V.T. 2008. Are we in the midst of the sixth mass extinction? A view from the world of amphibians. *PNAS* 105(Supplement 1) 11466-11473.

Also see Eldredge N. *The Sixth Extinction*. www.actionbioscience.org/newfrontiers/eldredge2.html?print