

The Great Commandment, Tao, and the Survival of Humanity

NICHOLAS BEALE¹ AND ROBERT POLLACK²

*But why should the species be preserved? ... Stepping outside the Tao, they have stepped into the void.*³

At present humans appear wildly successful in evolutionary terms: with a mass comparable to other primates we have an abundance comparable to insects. But this success is entangled with a paradox: evolutionary success is traditionally seen as based on fierce competition, yet our current success is unsustainable without unprecedented levels of cooperation. A partial resolution of this paradox comes from realizing that cooperation is a fundamental principle of biology, and indeed from our earliest primate ancestors, our biological origins lie in the emergence of the most complex and long-lived cooperative behaviors among extended families. Without these levels of cooperation the success of humankind would have been impossible. It is also significant that a number of major world religions attach great importance to widely-directed love, compassion, and respect for Creation, and that religion has historically been a substantial factor in widespread cooperation. So, we must now find out – quickly – whether the biological gift of a habit of cooperativeness, aided and abetted by religious or other underpinnings, will also be sufficient to save us as a species from the future consequences of our current success.

The need for cooperation of which we speak operates at several levels. The idea that scientific progress would inevitably lead to peaceful coexistence was tested in the 20th Century, and, in the memorable phrase of Roy Enquist, “the laboratory, as we now know, turned out to be an abattoir.”⁴ From at least the time of Archimedes, technological and scientific progress have been intimately linked with warfare. This reached an apotheosis with the development of nuclear weapons, which gave human beings for the first time a technology capable of substantially destroying the biosphere and making the continued survival of humanity decidedly questionable. It used to be asserted that a full-scale nuclear war might eliminate life on earth. However, what we now know about extremophiles makes this seem highly unlikely. Indeed many forms of insect might well survive a large-scale nuclear exchange.⁵ Equally, this is presumably the second, rather than the first,

1 Sciteb, One Heddon Street, London W1B 4BD UK Nicholas.beale@sciteb.com.

2 School of Biological Sciences, and Center for the Study of Science and Religion, Columbia University, New York, NY 10027 pollack@columbia.edu.

3 Lewis 1947, 77.

4 Enquist 2009, 76.

5 c/f (Flanders 1964): “The Brontosaurus had a brain no bigger than a crisp. The Dodo had a stammer and the Mammoth had a lisp.

The Auk was just too awkward, now they’re none of them alive.

time that humanity has had the capability for self-extinction: when there were only one or two tribes of *Homo sapiens* an axe or poor choices of drinking water might have done the trick. It is also a sobering thought that current evidence suggests that until about 20,000 years ago our primate ancestors were never alone, but always were in an ecological relationship with at least one other hominid species. It is unclear whether *Homo sapiens* killed off all the others or simply outlived them. Fortunately for humanity, there so far has been sufficient cooperation between the major nuclear powers to avoid a conflagration, although estimates of the probability of a disaster during the Cold War are alarmingly high.⁶

Other military technologies may conceivably confer the power of what we might term “Military Humanicide” on some subset of humanity. But there are further potential sources of catastrophe. Widespread international travel sadly makes global epidemics feasible. So far nothing has exceeded the devastation of HIV/AIDS, and it is sobering to consider how many millions of people had to change their behavior in order to contain this epidemic, both in terms of sexual practices and in terms of unprecedented behavior by pharmaceutical companies, as well as the devastating consequences it has wreaked in many countries, especially in Africa. It is quite probable that another more devastating epidemic will arise in the next 10-50 years, and by no means a foregone conclusion that humanity will cooperate sufficiently to avoid an even worse catastrophe. So “Microbial Humanicide” is, sadly, a real possibility. Then there is a cluster of environmental threats of which global climate change may be taken as a paradigm. Without going into the details, which are still uncertain, of exactly how bad the effects of human impacts on climate change will be, it is clear at least that a sufficient level of human irresponsibility could have devastating effects on the biosphere,⁷ so that “Environmental Humanicide” is a serious issue. For completeness we can add two more clusters of problems, which we might call “Logistical Humanicide” precipitated by a major global breakdown of the increasingly sophisticated logistics (both physical and IT) on which humanity depends, and “Astronomical Humanicide” whereby some event such as a major meteor strike has devastating consequences.

There are two common aspects of all of these, on which we want to focus attention. Firstly, with the exception of the Astronomical, all of these potential humanicides could be caused or seriously exacerbated by human behavior. Secondly, avoiding of any of these requires a substantial degree of “cooperation” involving people forgoing a present (apparent) benefit to avoid a serious medium- or long-

Each one, like ... Man, had shown himself unfitted to survive.
Their story points a moral, now it's we who wear the pants;
The extinction of these species holds a lesson for us ... Ants.”

What this lacks in biological accuracy it makes up in comic poignancy. (Flanders and Swann 1961) and (Flanders and Swann 1964) are also highly pointed warnings of the dangers of a nuclear holocaust.

6 Martin Rees, the immensely distinguished Astronomer and former President of the Royal Society, suggests that the risk was “substantially higher than one in six” (Rees 2003, 28).

7 McCarthy 2009, Weitzman 2009, Kousky et. al. 2009.

term harm.

Until around 1960 none of these situations really existed: Nuclear arsenals were a few megatons, there was probably insufficient large-scale global travel for a prospect of Microbial Humanicide, and although Astronomical Humanicide has been a constant risk, there was until recently nothing humanity could do about it. The first feasible humanicide, Military Humanicide, had, at least at the beginning, three characteristics that in a paradoxical way can be seen as highly desirable. The first is that restraint was required from only a very small number of human beings to avoid this disaster.⁸ In principle, so long as the presidents (or equivalent) of the USA and the USSR refrained from “pushing the button” nuclear holocaust could be avoided. And although this might be a source of weakness, because one of them could have become deranged, in practice it seems likely that people around them would have thwarted a deranged intention. The second desirable characteristic was that the disaster unleashed was very obvious and immediate. Launch a nuclear strike today and within a week your major cities would be destroyed. The third desirable characteristic was that the (apparent) benefits from launching a strike were very small. Villains in Bond movies may seek “Global Domination” but in practice large empires are ungovernable and have to be relinquished sooner or later, as the British and Russians discovered in the 20th century.

Compare these characteristics with HIV/AIDS or global climate change. Both restraint and cooperation are required from a large number of people: broadly speaking anyone who is sexually active with more than one partner and anyone who is economically active respectively. The time-delay between the deleterious behavior and a visible catastrophe is typically 5-15 years for HIV/AIDS and perhaps 30-100 years from climate change; the apparent benefits, sexual gratification and economic growth, are very alluring. Humans are notoriously bad at balancing short-term advantage against long-term disadvantage⁹ and even with “full rationality” the correct principles for such balancing are not entirely clear.¹⁰ There is an additional problem that, if we limit our understanding of humanity to *Homo economicus*, it is difficult to incentivize people after they are dead.¹¹ A deeper and more nuanced account of human behavior and motivation is evidently necessary to account for the considerable sacrifices that people do in fact make for the benefit of

8 Whether it was really true that a President or Prime Minister could have initiated a nuclear exchange by “pressing the button” on a whim is discussed amusingly in (Jay and Lynn 1986).

9 See eg (De Martino et al. 2006) and papers that cite this, such as (Mickels & Reed 2009). Paradoxically, it seems plausible that there is a significant evolutionary advantage in having human beings over-discount risk. Given the risks associated with childbirth and fighting for most of evolutionary history, a species composed entirely of *Homo economicus* would not have survived very long.

10 See the *Stern Review* on Climate Change, which adopted a 0.1% discount rate on the future costs relating to climate change, and the discussion and criticism of the review on this point, eg (Dasgupta 2006, Weitzman 2007).

11 One of the advantages of the hereditary principle is that it encourages longer-term thinking. Clearly, whatever the reason, caring about the future of your descendants gives a motivation for longer-term thinking. Indeed one aspect of the constitutional debate about monarchies and democracies is that democrats focus on the next election whereas monarchs focus on the next generation. This is not, of course, to say that monarchs necessarily act more wisely than elected leaders, and indeed in most successful monarchies the actual powers of the monarch are carefully limited.

future generations.

Without wishing to go into an excessive level of spurious quantification, we can see that in about half a century the level of cooperation required to avoid humanicide has gone from zero, through getting fewer than 10 people (less than 0.0000001% of humanity) to forgo a dubious benefit to avoid immediate catastrophic loss, to the present situation where on a 50-year view 10-90% of humanity must cooperate to avoid a catastrophe on a timeframe of decades.

Part of this paradox can be resolved by a reconsideration of the fact that cooperation is also a fundamental principle of biology.¹² At every level, life depends on cooperation: the ecosystem, the population, the organism, and the cell. Denis Noble is particularly eloquent about this in *The Music of Life* and subsequent writings.¹³ Against the apparently seductive reductionist paradigm popularized by Monod and Crick, Noble offers the view that biological explanations cannot ultimately either be “top down” or “bottom up” but must be “middle out.” That is, each level of a biological system needs to be considered in the context of the higher and lower levels, and no one level can be considered to be ‘fundamental’ from which the others could in principle be predicted. And a moment’s reflection makes it clear that the vastly complex and intricate mechanisms of biological cooperation are an essential pre-requisite to the competition that goes on at the edges and which has become the focus of much evolutionary thinking. Without cells, organisms, populations and ecosystems there can be no competition at all. We could adapt Edison’s famous dictum and say that biology is 1% competition, 99% cooperation.

Nevertheless, differences in degree can lead to differences in kind, and as we have argued above, the scale and level of cooperation now required to avoid humanicide is unprecedented. It is a sobering thought that one reason why we have not seen any sign of advanced alien civilizations is that the probability of an advanced civilization surviving for much more than 100 years after they have developed H-Bombs and similar technology may be very low.¹⁴

To reach the required levels of cooperation we need sufficiently widespread agreement between people on how they will act, even if there is a divergence of views on why these actions are needed. These agreements must be both within nation-states and across national boundaries. As Amartya Sen powerfully argues in *The Idea of Justice*, one of the serious weaknesses of the social contract approach to thinking about issues of justice is its inability to deal convincingly with issues across generations and across nations.¹⁵ If justice is supposed to derive from a hypothetical social contract that might have been reached by a group of people from an “original position” as Rawls suggests, then what of people who are excluded from this group, either because they are not part of the nation in question or be-

12 Nowak 2006.

13 Noble 2006 and Noble 2008.

14 Beale, 2009 discusses some cosmological implications of this in the context of global cooperation.

15 Sen 2010.

cause they are as yet unborn?

These difficulties apply with perhaps even greater force to purely prudential appeals to moral behavior based on social norms, reciprocity or kin selection.¹⁶ The idea that people are, or perhaps more bizarrely, should be, motivated mainly by a desire to propagate their genes is one of the more ludicrous misunderstandings of the late 20th Century. Haldane's dictum ("I will sacrifice my life for two brothers or four cousins") has a nice mathematical feel to it, but in the light of the 96% similarity between the chimpanzee and human genome a devout follower of this rule would feel compelled to sacrifice himself and his wife for three chimpanzees, and of course for three humans however distantly related since there is even greater genetic similarity. Indeed a sufficient number of *Drosophila* could be said to contain more "human genes" than a human town. One of the major lessons of the recent discoveries in genetics is that genes really are not remotely as important as people previously supposed. Noble is very good on this, pointing out that "biological functionality is multilevel... yet the language of modern reductionist biology often seems to deny this obvious truth" that "there is no privileged level of causality" and there are, strictly speaking, no programs, genetic or otherwise, in biological systems;¹⁷ so are Eva Jablonka and Marion Lamb when they draw our attention to the multiple dimensions on which evolution takes place, such as: genetic, epigenetic, linguistic and cultural.¹⁸ It is also worth noting in passing that western secularists who claim that "the purpose of life is to propagate genes" tend to have significantly fewer children on average than religious people in similar societies. Groucho Marx's "why should I care about posterity? What's posterity ever done for me?" is a question which is very difficult to answer in purely secularist terms.¹⁹ If life is indeed a largely meaningless epiphenomenon, on an insignificant rock orbiting an ordinary star which will in due course be destroyed, and if there really is nothing but matter/energy, then why indeed should we bother?

Public Goods games often lead to depressing conclusions: that players fail to avert a catastrophe by making relatively small sacrifices even when every player knows that, if they don't show the necessary restraint, they will lose everything.²⁰ If many or even most of the players believed that they could leave the game with their winnings before the catastrophe occurred, and that the catastrophe would happen to other people, the conclusions would be even bleaker. We think serious research is needed about what we might call Delayed Catastrophe Games, and would welcome collaborators on this.

But there is another way of telling the human story. Instead of beginning with matter/energy we can begin with love and wisdom – indeed in the beginning, God.²¹ If "rational self-interest" in people's own lifetimes may not lead to the

16 Nowak et al., 2010 comprehensively demolishes some exaggerated claims about kin selection.

17 Noble 2008 .

18 Jablonka and Lamb 2006.

19 See eg Beer 2008.

20 Milinski et al. 2008, Tavoni et al. 2010.

21 A fuller exploration of the authors' respective approaches to this are in (Polkinghorne and Beale 2009) and (Pollack 2000).

necessary levels of cooperation, how about a worldview based on the primacy of love and wisdom?

As C.S. Lewis famously pointed out in *The Abolition of Man* there is a great deal of agreement between major world religions about the fundamental principles of human behavior.²² When Jesus singles out “Love your Neighbour as yourself” as the second great commandment he is of course quoting Leviticus 19:18. In his parable of the Good Samaritan he implies strongly that this commandment should be interpreted really widely; indeed Leviticus 19:33 already extends this to “aliens.”

Interpreted sufficiently widely, this “ethic of deep reciprocity” potentially contains the seed for the survival of humanity. Why should I restrain my consumption, my sexual behavior, or my greenhouse gas emissions for the benefit of billions of others whom I will never meet? Love your neighbor as yourself. Why should people devote resources to address problems, such as meteor impact, of which the devastating consequences are more likely to happen after their death than before it? Love your neighbor as yourself

Of course love is not a panacea. Love needs to be complemented by wisdom. Consider for example a “universal love”, however sincere, that involved giving everyone nuclear weapons. Or the mental shortsightedness that refuses to act to avoid problems even when it would be in your self-interest to address them. Many disastrous actions have been taken, at least allegedly, for the best of motives: food aid given in such a way as to undermine the economics of a poor country’s farmers; policies of economic self-sufficiency that condemn hundreds of millions to unnecessary poverty; extending loans to people with no income and no assets so that they can buy houses that they cannot afford and eventually precipitating a massive financial collapse are just three examples. One essential aspect of scientific discovery is that it allows people to take wiser decisions. The science of the ozone layer and climate change both spring to mind. But although scientific knowledge may be an enabler of wisdom, there is more to wisdom than factual information. T.S. Eliot’s plangent lines: “Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?”²³ become increasingly pertinent as scientific “progress” deluges us with more and more papers. We cannot, from a scientific point of view, specify what values humans should adopt. But we can observe that certain sets of values will be compatible with continued evolutionary success, whereas others will not. It is clear that we need an “ethic of enough” in respect of most material things.

These notions of value go well beyond the domain of science. The emergence in nature four billion years ago of novel positive feedback loops of self-replicating informational molecules (DNA and RNA), may well be the natural source of life, but cannot of itself provide the values or motivations required. However, it is interesting at least to contemplate the possibility that scientific investigation of the conditions necessary to the continued survival and flourishing of humanity may accord with some of the deepest wisdom from religious traditions that have been with us for millennia. Impoverished worldviews, in which human beings and

22 Lewis 1943, esp 95-121.

23 Eliot 1934.

all other forms of life are just lumbering robots controlled by selfish genes, are being replaced by deeper understanding, which realizes the fundamental significance of inter-relationships and cooperation.²⁴ We think this will lead to increasing convergence between the worldviews of those for whom Matter/energy is the most fundamental, and of those who see, behind these realities, the love of God.²⁵

REFERENCES

- Beale, Nicholas. 2009. "Can Discoverability help us understand Cosmology?" *Journal of Cosmology* 3:529-539.
- Beer, Gillian. 2008. "Imagining Posterity, then and now." *International Literary Quarterly* November 2008. http://www.interlitq.org/issue5/gillian_beer/job.php (accessed 15-Aug-2010).
- Dasgupta, Patha. 2006. "Comments on the Stern Review's Economics of Climate Change." www.econ.cam.ac.uk/faculty/dasgupta/STERN.pdf (accessed 11-Aug-2010).
- De Martino, Benedetto, Dharshan Kumaran, Ben Seymour, and Raymond J. Dolan. 2006. "Frames, Biases, and Rational Decision-Making in the Human Brain". *Science* 313, 684-687.
- Eliot, TS. 1934. Choruses from *The Rock: A Pageant Play Written for Performance on Behalf of the Forty-Five Churches Fund of the Diocese of London*. London: Faber and Faber.
- Enquist, Roy. 2009. *The Courage to Believe*. El Paso: Hansen-McMenamy Books.
- Flanders, Michael. 1964. Introductory poem in *Creatures Great and Small*. London: Dobson Books.
- Flanders, Michael and Donald Swann. 1961. "The Ostrich" in *The Bestiary* London: EMI. Text in *The Songs of Michael Flanders & Donald Swann* London: International Music Publishers, 2nd Ed 1996. p164.
- . 1964. "20 Tons of TNT" in *The Extiary* London: EMI. Text as above p62
- Jablonka, Eva and Marion Lamb. 2006. *Evolution in Four Dimensions*. Cambridge: MIT Press.
- Jay, Anthony and Jonathan Lynn. 1986. "The Grand Design" in *Yes Prime Minister*. London: BBC Books.

24 See eg Polkinghorne & Beale 2009 esp pp 9-11, and 117-150.

25 Wilson 2006 is an example of a step in that direction.

- Kousky, Carolyn, Olga Rostapshova, Michael Toman, and Richard Zeckhauser. 2009. "Responding to Threats of Climate Change Mega-Catastrophes." RFF Discussion Paper - RFF DP 09-45.
- Lewis, CS. 1947. *The Abolition of Man*. New York: Macmillan.
- McCarthy, James J. 2009. "Reflections On: Our Planet and Its Life, Origins, and Futures." *Science* 326 1646-1655.
- Mickels, Joseph A. and Andrew E. Reed. 2009. "Monetary Losses Do Not Loom Large in Later Life: Age Differences in the Framing Effect." *J Gerontol B Psychol Sci Soc Sci* 64B (4): 457-460.
- Milinski, M., Sommerfeld, R. D., Krambeck H-J., Reed F. A., and Marotzke, J. 2008. "The collective-risk social dilemma and the prevention of simulated dangerous climate change." *Proceedings of the National Academy of Sciences*, 105 2291-2294.
- Noble, Denis. 2006. *The Music of Life: Biology beyond the Genome*. Oxford: Oxford University Press.
- Noble, Denis. 2008. "Claude Bernard, the first systems biologist, and the future of physiology." *Experimental Physiology* 93, 16-26.
- Nowak, Martin. 2006. "Five Rules for the Evolution of Cooperation." *Science* 314, 1560.
- Nowak, Martin, Corina Tarnita, and EO Wilson. 2010. "The evolution of eusociality." *Nature* 466. 1057-1062
- Polkinghorne, John and Nicholas Beale. 2009. *Questions of Truth: Fifty one Responses to Questions about God, Science and Belief*. Louisville: Westminster John Knox Press.
- Pollack, Robert. 2000. *The Faith of Biology and the Biology of Faith: Order, Meaning and Free Will in Modern Science*. New York: Columbia University Press.
- Rees, Martin 2003 *Our Final Century?: Will the Human Race Survive the Twenty-first Century?* London: William Heinemann.
- Sen, Amartya. 2010. *The Idea of Justice*. Cambridge: Belknap Press of Harvard University Press.

- Tavoni, Alessandro, Astrid Dannenberg, and Andreas Löschel. 2010. *Coordinating to Protect the Global Climate: Experimental Evidence on the Role of Inequality and Commitment* ZFW Discussion Paper No. 10-049
- Weitzman, Martin L. 2007. "A Review of the *Stern Review on the Economics of Climate Change*." *Journal of Economic Literature*, 45(3): 703–724.
- Weitzman, Martin L. 2009. "On Modeling and Interpreting the Economics of Catastrophic Climate Change." *The Review of Economics and Statistics*, 91(1), 1-19
- Wilson, EO. 2006. *The Creation: An Appeal to Save Life on Earth*. New York. W. W. Norton.