Relearning Humility in a Time of Climate Change

Larry Lohmann
1400 Sahitya magazine (West Bengal)
July 2007

Let me not pray to be sheltered from dangers but to be fearless in facing them. Let me not beg for the stilling of my pain, but for the heart to conquer it. Let me not crave in anxious fear to be saved, but hope for the patience to win my freedom.

Rabindranath Tagore

One of the hardest things to learn is how to unlearn. For professionals in particular, calling into question the techniques and assumptions that have brought them power and success often requires a lot of imagination, patience, fortitude, willingness to sacrifice respectability – and the ability to find supportive new friends.

Yet when expertise becomes irrational, or even a threat to survival, few tasks are more important. Many years ago, Amartya Sen said it was time for economists and their followers to unlearn their trick of simplifying human beings into self-interested calculating machines. In an age of global warming, many experts also need to unlearn the way they treat history as calculable and linear. As the options trader and philosopher Nassim Nicholas Taleb has recently put it, the world is not the "Mediocristan" most economists and policymakers imagine it to be – a land of well-behaved probabilistic bell curves and "risk management" where individual variation averages out and no single event is capable of changing the big picture. It is, instead, "Extremistan", a land also inhabited by what Taleb calls "Black Swans" – unlikely but unpredictable events of extreme and lasting impact.

Nothing makes this clearer than climate change. The earth's climate, as scientists have realized in recent years, is a chaotic system with a tendency to jump from one extreme to another. At some unpredictable point, increased meltwater can alter ocean currents in a way that quite quickly changes the way weather patterns are distributed over the whole globe. Similarly, a little warming, directly or indirectly, has a way of eventually setting off massive releases of greenhouse gases from ocean floors, peat bogs or forests, quickly propelling world weather into a new, much hotter equilibrium. In an unstable climate system, runaway feedback effects triggered by obscure factors such as the reduced capacity of warming oceans to absorb carbon dioxide are capable of radically altering even such symbols of unchangeability as the Indian monsoons. Such "monsters" – the word Chris Rapley of the British Antarctic Survey uses – have often been awakened in the distant past, shuttling the world between ice ages and eras of steamy heat. The prospect of the same thing

happening again now may seem outlandish. Human history has taken place in one of the two short periods of relative climatic stability of the last 100,000 years. Climatic “flips” lie pretty much outside cultural memory. But industrialized society’s practice of pumping carbon from fossil fuels into the biosphere is rousing the monsters again. New and unknown beasts – Black Swans – also wait in the menagerie. Levels of carbon dioxide are already higher than before many previous climatic “flips”. In the current situation, the only certainty is uncertainty itself.

None of this has made much impression on economic thinkers and policymakers. Reluctantly, they have come round to the idea that the world is warming. But they still expect to be able to go to their offices every day and do what they have always done. They need the world to warm in a predictable, incremental, linear way that can be mapped onto economic graphs. Therefore it will do so. They need to be able to calculate in advance the probability of any possible climatic shift. Therefore such calculations must be possible. They have a vested interest in drawing cost-benefit curves that will tell them when and how much to invest in fighting global warming. Therefore it must be possible to draw such curves. They need to know how much climate change the aviation industry, say, will cause over the next 100 years so that they can figure out how much “compensation” it should pay to Thameside homeowners or the families of drowned Bangladeshis. Therefore such things must be knowable. The Danish statistician Bjørn Lomborg has calculated, po-faced, that the cost of doing nothing about climate change will be precisely US$4.8 trillion – not worth slowing economic growth for. The British government’s Stern Report, although it contends that global warming is a bit more serious than that, backs up its position by performing the same kind of trick, suggesting that, depending on what discount rate you choose, each tonne of CO_2 causes social damage worth “at least $85”.

This mixture of escapism and arrogance about what can and cannot be calculated – rooted largely in the imperative to preserve business as usual and clothed in the mathematical formulae of “probability” and “risk” – is not confined to economists, statisticians and politicians. It even intermittently influences the thinking of climate scientists themselves. It is not that the scientists don’t know that it’s not possible to calculate the probability that global temperatures will rise two, five or ten degrees given a specified increase in greenhouse gas concentrations. They know that not even all the factors that could influence such outcomes are understood, much less how important they might be or how they might interact with other factors. But all that goes by the board when they step into a room in which economists, policymakers or journalists are present. There, they find themselves under pressure to come up with a tidy cluster of the “likeliest scenarios” to feed into economic or political models. Intimidated, they begin to make statements about the “probabilities” of, say, a two or five degree temperature rise by 2100, obediently discounting the uncertainty and incompleteness of the set of assumptions on which such

calculations are based. Extreme outcomes and nonlinear change are excluded not only because of an all-too-human linear bias but also because economic thinking cannot easily handle them.

In a recent documentary about climate change produced by a British television station, a leading climate scientist was asked to rebut the charge that climate predictions were "too uncertain" to act on. Perhaps prompted by the programme's producer, he stepped out on a golf course and hit a number of balls down the fairway. Of course, the balls ultimately formed a neat pattern. His skills and physical strength – falling within well-established human limits – saw to that. With the exception of a few wild shots, most balls were found clustered within a single ellipse. The scientist then explained that the balls were like the climate predictions that supercomputers churn out. If you fed different assumptions into the computers, you got slightly different results. No single prediction could be counted on to reflect exactly the way things would turn out. But all the predictions would cluster reassuringly around a central area and no outlier would be too important or too far away. He said that it followed that you could be pretty confident that climate outcomes, too, would fall within certain defined limits.

I asked another climatologist what he thought about this attempt to wish away the significance and size of the outlying "monsters" of climate change. He bristled slightly and said that it was perhaps the only way of explaining to an uninformed public that climate science's uncertainties were not a reason for dismissing its results. For the public's sake, he said, you had to domesticate uncertainties and ignorance into "probabilities" even if it was unscientific to do so. Scientists had to go along with economists' and journalists' falsifications in order to get people to see the truth. They had to destroy science in order to save it. Similarly, Stephen Schneider, an expert from Stanford University, says that it is all right for climate modellers to "assign confidence levels, albeit subjective ones, to their outcomes" in order to help governments "weigh up the probability of various events and . . . capture the 'cascade of uncertainties' inherent in climate models", as long as the "methods used to assume risk are laid alongside the results". The International Panel on Climate Change, the body of experts that advises UN climate negotiators, has so far voted to leave out of its reports what is called "Type II" climate change – the abrupt, messy, chaotic, surprising kind that results from the crossing of hidden "tipping points". Instead, it restricts its discussion to "Type I" climate change, which follows smooth, well-behaved, economics-friendly, global temperature curves.

It is worth spending a moment to try to locate exactly where the difficulty is here. The problem is not that climatologists are letting themselves be influenced by journalists, diplomats, economists and politicians. That sort of thing happens in all fields. Films are written not only by screenwriters but also by producers, directors, actors, even set designers – and not necessarily with ill results. In a sense, every peer-reviewed academic article or book is a

collaboration with the authors' interlocutors in a variety of fields, past, present and future. That is as it should be. The question is more who those collaborators are, what their powers and interests amount to, how their role is understood and what the consequences of their influence are.

One of the great chroniclers of the part of the world I live in, Thomas Hardy, chose to falsify or erase the often rebellious political feelings and understandings of the 19th century rural labourers he wrote about. Hardy's interlocutors – his editors, his middle-class readers, and the social set he aspired to be a member of – did not want to hear about them. So he resorted in his fiction to the comic stereotype of the resigned rural fatalist, the unchanging, guffawing, picturesque rustic clown. Hardy wrote distinguished novels about doomed marriages and ambitions, rural Dorset livelihoods, and how the cold rain felt to field labourers when it fell on their backs, but left out their often bitter thoughts about privilege and injustice. The novels he might have written never appeared, partly because the collaborators he revered were not interested. Today's climatology is the same. Like Hardy, climatologists are heroes who have illuminated their age. But they are not always to be trusted as sources of authority about how to think about risk, uncertainty, surprise, survival and the political future.

Academic wags used to say that economists suffered from "physics envy". They were accused of going overboard to mathematize and "modelize" their "soft" discipline to try to make it "harder" than it really was. Now it seems the shoe is on the other foot. Today it is many atmospheric physicists who go overboard to try to treat their science as if it were an adjunct of orthodox economics. Patterns of change in carbon cycles and ocean currents are reconceptualized so that they will appear to pose no threat to the supposedly more "solid" realities of global markets and economic growth.

In what space remains I would like to mention two more examples of how the hubris of much contemporary economic thinking affects the way people think about climate. One example is the new financial instrument known as the catastrophe bond. Unsurprisingly, insurance companies were among the first business sectors to see the radical uncertainty and Black Swans of climate change as a threat. As early as the 1990s, Andrew Dlugolecki of Swiss Re thought the whole sector could be destroyed when climate disasters – storms, floods, droughts – became impossible to insure against. In the aftermath of Hurricane Andrew in 1992, catastrophe bonds were invented in order to try to pass "climate risk" on to investors. Buyers of such bonds make a lot of money if a certain catastrophe – say a Category 5 hurricane in Florida – does not happen by a certain year. Otherwise they lose their investment. On one level this is an effort to reconcile the survival of the insurance industry with the sweeping uncertainties of global warming. More coherently, it is a hopeful attempt to make money out of speculators who either do not grasp or can afford to gamble on the Black Swans of climate. By now, not only insurance

companies but also corporations and government agencies sponsor catastrophe bonds. In the period following Hurricane Katrina, over US$4 billion were sold.

A second example of the attempt to repackage climate change to make it "safe" for business as usual is carbon trading. Revolving around the neoliberal belief that a system of private property and trade must by definition be able to solve social and environmental problems, carbon markets, by offering profits to business, hold out to governments the promise of a politically easy way of being seen to be taking action. A recent innovation in neoclassical economic theory, they have attracted the faith of financial brokers, Washington conservationists, the United Nations and the European Union alike.

To theorists of carbon markets, global warming is a "market failure" – a problem of inefficiency and incorrect prices. It can be solved by commerce. Governments provide corporations with tradable rights to pollute the atmosphere with greenhouse gases. They then promise someday to reduce the overall amount of these rights to the "correct" level – one that will moderate global warming sufficiently without costing too much. Business responds to the law of supply and demand by economizing on its use of pollution rights and finding new supplies. Companies that find it too expensive to undertake long-term investments in low-carbon means of production – power generators, cement firms, oil and gas companies, airlines, steel mills, and so forth – delay action by buying cheaper pollution rights elsewhere. Just as the profit motive gives business incentives to produce wheat, paper and steel at the cheapest price, it will also – so the theory goes – drive it to seek the cheapest ways of stabilizing the climate.

Carbon trading involves some of the most unconsciously insolent claims to knowledge about the future ever made. A European electricity generator that wants to pay a chemical company to reduce CO_2 emissions by 100,000 tonnes instead of doing so itself is obliged to assert that it knows that the technological changes the chemical company makes to do so will lead to precisely the same climatic results at the end of history as the technological changes the generator itself would have to make to achieve the same cut. If the electricity generator decides instead to avoid cutting emissions by paying a coal-fired generating company in China to make efficiency improvements that save 100,000 tonnes of carbon dioxide, it is compelled to claim that it knows that the Chinese plant would not have made such improvements anyway. And it has to assert that the extra money that the trade provides to long-term fossil fuel development in China will have no effect on future emissions. Similarly, if the generator pays a plantation firm to plant eucalyptus in India to absorb a certain amount of carbon dioxide emissions, it is required to claim to know exactly how much carbon the land would have absorbed without the plantation, for a century or more. It must specify a single hypothetical timeline including all significant future inventions, social innovations and price movements that would occur over the next 100 years that could affect that land. And it must show that its

prediction is not self-invalidating – that, for instance, the eucalyptus plantation company, once it knows how carbon accounting is done, will not degrade the land in advance in order to "prove" that the plantation would be better than any alternative.

The overconfidence that carbon trading requires about what can and cannot be computed is institutionalised. The United Nations not only claims that carbon credits derived from "carbon-saving" projects are climatically *equivalent to* reductions in emissions by Northern industry. It actually refers to them *as* emissions reductions. No individual scientist advising the parties to the Kyoto Protocol's carbon market schemes is allowed to question this identification. None has ever done so, at least publicly. The political effects are far-reaching. As mentioned above, anyone wanting to sell carbon credits under the Kyoto Protocol must conjure up economic data that "proves" that efficiency improvements or improvements in biotic uptake of carbon, say, would not have happened without carbon investment. It costs money to hire experts to produce documents complicated enough to conceal the implausibility of such claims. That is one reason why sellers of carbon credits are not small communities maintaining or pioneering low-carbon lifestyles or working to prevent fossil fuel developments in their localities. Instead, they are rich firms like Tata Chemicals, Birla, ITC, Chhatisgarh Electricity and Shri Bajrang. Polluters are rewarded and constructive initiatives penalized. Carbon trading becomes even more counterproductive as an approach to climate change.

Institutionalised arrogance has its own momentum. As I write this, I have just come from a meeting where officers of a prominent Oxford-based development, advocacy and relief agency were mulling over what they planned to say and do about the climate crisis. What I was most struck by was how the organisation's staff members kept asking if there could be any alternative to carbon trading. They understood that carbon trading made climate change worse. They knew that the corporations that benefit from it are enemies of the poor whose interests the agency was set up to defend. They were aware that although pollution trading had been invented only a few decades ago, it already had a record of failure when compared with other means of environmental protection. They were also well acquainted with Black Swans. Many had grown up with the fall of the Berlin Wall, the breakup of the Soviet Union, the crashes of 1987 and 1997, the events of 9/11. They knew, too, that unexpected scientific discoveries about the mechanisms of climate change will continue to be made. They would probably be the last to describe themselves as escapist or lacking in humility. Yet to the end, these well-meaning professionals remained credulous of the claim of merchant bankers, consulting firms and government officials that anything other than carbon trading must be a mere "alternative" approach to global warming. It had become possible, even normal, for them to partake in an extraordinary intellectual arrogance they did not create.

If today's efforts to turn climate into a commodity have only undermined the ability of the "educated" class to unlearn this arrogance, what hope is there for the "uneducated"? The question must be turned around. It is more likely to be sets of practices that do not exclude the "uneducated" – commons regimes, subsistence agriculture, family life, to name a few – that, despite and because of their own contested nature, best teach the hazards of overreliance on commodification and prices, of placing cost-benefit analysis above a safety-first orientation, and of staking everything on an effort to compute the incomputable. Because the contradictions between survival and economics are always before them, such institutions will continue to be, with all their problems, prime sources of scepticism about, and resistance to, the hubris that treats history and human beings alike as idealized machines.

Tagore wrote of "those who walk on the path of pride"

> . . . crushing the
> Lowly life under their tread, covering the tender green of the earth
> With their footprints in blood;
> Let them rejoice, and thank thee, Lord, for the day is theirs.

But the "morrow" belongs to "the humble who suffer and bear the burden of power":

> O Sun, rise upon the bleeding hearts blossoming in flowers
> Of the morning, and the torchlight revelry of pride shrunken to ashes.

REFERENCES

Allen, M., S. Raper and J. Mitchell, "Climate Change — Uncertainty in the IPCC's Third Assessment Report", *Science* 293 (5529), 2001, pp. 430–433

Dessai, Suraje and Mike Hulme, "Does Climate Policy Need Probabilities?", Tyndall Centre Working Paper 34, Exeter, 2003.

Dessai, Suraje, Karen O'Brien and Mike Hulme, "Uncertainty and Climate Change", *Global Environmental Change* 17, 2007, pp. 1–3.

Dick, Philip K., "The Minority Report", *Fantastic Universe*, January 1956.

Fagan, Brian, *The Long Summer: How Climate Changed Civilisation*, Granta, London, 2004.

Grubler, A. and N. Nakicenovic, "Identifying Dangers in an Uncertain Climate", *Nature* 412 (6842), 2001, p. 15.

Hall, Jim, Guangtao Fu and Jonathan Lawry, "Imprecise Probabilities of Climate Change: Aggregation of Fuzzy Scenarios and Model Uncertainties", *Climatic Change* 81, 2007, pp.265–281.

Hansen, James E., "Scientific Reticence and Sea Level Rise", *Environmental Research Letters* 2, April-June 2007, http://www.iop.org/EJ/article/1748-9326/2/2/024002/erl7_2_024002.pdf.

Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis*, Cambridge University Press, Cambridge, 2007, http://ipcc-wg1.ucar.edu/wg1/wg1-report.html.

Knight, Frank, *Risk, Uncertainty and Profit*, Harper and Row, New York, 1921.

Kriegler, Elmar and Hermann Held, "Utilizing Belief Functions for the Estimation of Future Climate Change", *International Journal of Approximate Reasoning* 39, 2005, pp. 185–209.

Lempert, R. J. and M. E. Schlesinger, "Climate-Change Strategy Needs to be Robust", *Nature* 412, 2001, p. 375.

Lohmann, Larry (ed.), *Carbon Trading: A Critical Conversation on Climate Change, Privatisation and Power*, Dag Hammarskjold Foundation, Uppsala, 2006, http://www.thecornerhouse.org.uk.

Lohmann, Larry, "Activism, Expertise, Commons", *Development Dialogue* 47, June 2006, pp. 149-181.

Lomborg, Bjorn, *The Skeptical Environmentalist*, Cambridge University Press, 2001.

Minh Ha-Duong, Rob Swart et al., "Uncertainty Management in the IPCC: Agreeing to Disagree", *Global Environmental Change* 17, 2007, pp. 8–11.

Mitchell, Timothy, *Rule of Experts: Egypt, Techno-Politics, Modernity*, University of California Press, Berkeley, 2002.

Moss, Richard H., "Improving Information for Managing an Uncertain Future Climate", *Global Environmental Change* 17, 2007, pp. 4–7.

North, Douglass C., "Dealing with a Non-Ergodic World: Institutional Economics, Property Rights and the Global Environment", *Duke Environmental Law and Policy Forum* 10, 1, 1999, http://www.law.duke.edu/shell/cite.pl?10+Duke+Envtl.+L.+&+Pol'y+F.+1.

Pearce, Fred, *The Last Generation: How Nature Will Take Her Revenge for Climate Change*, Random House, London, 2006.

Pittock, A. B., R. N. Jones and C. D. Mitchell, "Probabilities will Help us Plan for Climate Change — without Estimates, Engineers and Planners will Have to Delay Decisions or Take a Gamble", *Nature* 413, 6853, 2001, p. 249.

Rougier, Jonathan, "Probabilistic Inference for Future Climate Using an Ensemble of Climate Model Evaluations", *Climatic Change* 81, 2007, pp. 247–264.

Schneider, Stephen H. "What is 'Dangerous' Climate Change?", *Nature* 411, 6833, 2001, pp. 17–19.

Schneider, Stephen H., "Can we Estimate the Likelihood of Climatic Changes at 2100?", *Climatic Change* 52, 4, 2002, pp. 441–451.

Powers, Thomas, "What Tenet Knew", *New York Review of Books*, 19 July 2007, pp. 70-74.

Sen, Amartya K., "Rational Fools: A Critique of the Behavioural Foundations of Economics", *Philosophy and Public Affairs* 6, 4, pp. 317-344, Summer 1977.

Shackle, G. L. S., *Decision, Order and Time in Human Affairs*, Cambridge University Press, Cambridge, 1961.

Shackley, S., P. Young, S. Parkinson and B. Wynne, "Uncertainty, Complexity and Concepts of Good Science in Climate Change Modelling: Are GCMs the Best Tools?", *Climatic Change* 38, 2, 1998, pp. 159–205.

Snell, K. D. M., *Annals of the Working Poor: Social Change and Agrarian England 1660-1900*, Cambridge University Press, Cambridge, 1985.

Stainforth, D. A., T. Aina et al., "Uncertainty in Predictions of the Climate Response to Rising Levels of Greenhouse Gases", *Nature* 433, 27 January 2005, pp. 403-406.

Stern, Nicholas, *The Economics of Climate Change: The Stern Review*, Cambridge University Press, Cambridge, 2007, http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm.

Taleb, Nassim Nicholas, *The Black Swan: The Impact of the Highly Improbable*, Allen Lane, London, 2007.

Thompson, E. P. "The Moral Economy Reviewed", in *Customs in Common*, Free Press, New York, 1990, pp. 259-351.

Thompson, Michael et al., *Uncertainty on a Himalayan Scale*, Milton Ash, London, 1986.

Young, P., S. Parkinson and M. Lees, "Simplicity out of Complexity in Environmental Modelling: Occam's Razor Revisited", *Journal of Applied Statistics* 23, 2–3, 1996, pp. 165–210.