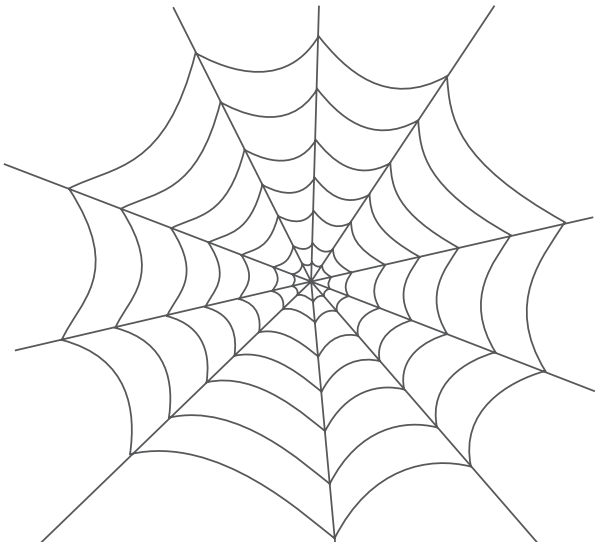
An Interview with
David Korowicz
by Alexander Ac

How to be Trapped

Anger and Complicity in a time of Limits.



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How
to be
Trapped

Anger and Complicity in a time of Limits.

An extended interview with David Korowicz by Alexander Ac

Interview initially recorded in Brno, Czech Republic on 29 January 2014 during David's lecture tour in Slovakia and the Czech Republic. It was then re-edited over the following month. It comprises two parts: How to be Trapped and Anger & Complicity in a time of Limits.

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Part I: How to be Trapped

AA: How did you start to be interested in the complex adaptive systems and why?

DK: I've always had a sensibility towards the dynamic relationship of things, finding myself drawn to post-structuralist thinking and Buddhist metaphysics for example. Such perspectives emphasize both the conditionality and dynamic interdependence of the universe, life, words and meanings. My academic background is in physics and though we never had a course in complex systems, I did some graduate work on the origin of entropy and time in the universe which does lead on to the birth of complexity.

But a pivot in my life, how I ended up doing what I do now, arose out of something quite unexpected. I was living in Central Asia and used to spend some time in a small village in Kyrgyzstan visiting my friend, an ethno-biologist who was researching apples and home gardens. This part of the world is the original source of the apple and there's still huge biodiversity, the neighboring village had 49 varieties! Home gardens provided people with food and over a third of their annual cash income, just a few hundred dollars.

To cut a long story short, a development project was proposed that would increase the efficiency of these gardens and thereby ensure families could boost their income. Life could be hard and at a minimum it could mean that families had a cash buffer for a crisis or could afford indoor sanitation. It promised in its own small way integration with the global narrative that seemed to point towards rising wealth, opportunities, social and political rights. It also justified the socially and economically progressivist world-view of the western development agencies who could be virtuous, adventurous and of course, right.

The proposal was to provide new tree varieties- ones that produced sweet and unblemished apples that could be sold for a good price rather than the established motley crew of apples that might be too bitter, too prone to pests, too ugly and so on. In addition, they would provide pesticides, fertilizers and better seed varieties to boost general home garden production and income. It could all be paid for by micro-loans, though less 'micro' in relative terms.

It was one of those situations where you only see something quite obvious because it's observed out of a familiar context. I'd been reading about climate change and peak oil, and I wondered about their implications for the proposal.

I imagined that the villages went along with this, their soil productivity increased with inputs and debt was serviced. Needs were met, and wants, in time, became needs. New and more intricate levels of dependence would develop as their increased income stream would facilitate more borrowing as expectations and the costs of integration (a car, a university course) rose. They would still be poor by European standards and therefore also more vulnerable to the rising cost of essential inputs.

Then if fossil fuel prices rose significantly the villagers would be forced to cut agricultural inputs, production would fall significantly and the burden of debt-to-income would rise. If on top of this changes in climate started affecting their 'perfect' apple trees, they would have nothing to fall back upon, as the inefficient but resilient biodiversity of seed and soil and motley apple trees would have been lost.

If growth was a smooth and positive progression, the reversal could be a relatively abrupt multi-system failure that would leave people much worse off than before the project started. Further, once one embarked upon such a path it would become increasingly difficult to step off. What it gave me was a clear demonstration of how to be trapped. But if this was the narrative for a relatively simple society, what did it mean for the far more complex society that I came from, how trapped were we? Increasing connectivity and global integration has by-and-large been very good for human welfare and risk reduction, but it looked like the balance of risk was turning. With a sense of curiosity and some alarm I returned to Ireland with the intention of engaging in this sort of thing, whatever that was!

Here, fortunately, I was introduced to the late Richard Douthwaite and Feasta. Richard had a wonderful capacity for encouragement with a wide and critical intelligence. Critically for me he was interested in money and credit, how they were created and how they shaped our world. So I began trying to understand the globalised economy, not as an economist might, but more as a naturalist might, but with a sense that I was also a biased and blinkered observer. The general field of complex adaptive systems had already developed concepts and analytic tools that could be applied to the globalised economy in a way that suited my natural inclinations. It also became clear that if one wanted to understand the evolution, stability and especially the collapse of complex societies then academic economics had very limited explanatory power and critically, was structurally blind to such basic transformations as complexity growth and catastrophic transitions.

Thankfully, the village project never got the go-ahead.

AA: If you look today in the mainstream media and politician's talks, everyone wants to restart growth. Is it a good idea?

DK: It's a good idea, sort of. It's part of our worldview, methodologies, our institutional structures, it's what our society is adaptive to. Economic growth is not just an indicator, it represents and sometimes obscures a complex structural dependency. If we don't have it there are major social, economic and political implications. If we want all the things we take for granted to continue, yes, of course we should re-start growth.

The problem is that continued economic growth is not necessarily our choice. I suspect we are at the limits to growth about now (I won't argue over a few years). Our financial and monetary system, whose ties of trust and expectation animate the world in an act of faith is increasingly unstable because it has far over-promised what can ever be delivered; the oil (and thus food) flows that maintain global socio-economic organization are peaking; and increasingly the effects of climate change and water shortages are biting at our heels. What's more, our dependency on a complex globalised economy, its structure and dynamics, makes us exceedingly vulnerable to such constraints.

We're likely entering a ragged globally developing deflationary spiral; a cycle of falling confidence, credit and money supply that leads to rising unemployment, falling wages and government income, growing bad debts, bank failures and an increase in the real cost of debt. There will also be an attendant and growing risk of a catastrophic financial and monetary system shocks with severe multi-system implications. A global credit bubble effectively pushed out the timing of peak oil, a deflationary spiral will bring it upon us. That said, we might not notice oil constraints initially (energy prices may fall significantly although it may be less affordable) because a depression and even a potentially

catastrophic financial shock will have shattered the global economy's capacity to use energy and resources. And if this happens there'll be no going back, we'll have entered a new phase of forced localization and huge new challenges.

It's pretty easy to point out the problems with our dependence upon a debt based monetary system or fossil fuels, or with the lack of redundancy in critical infrastructure. There are plenty of ardent promoters of, for example; non-debt based money spent-into-circulation; using quantitive easing to extinguish private debt; or a new Chicago Plan - putative white chargers coming to the rescue. But to frame such ideas as solutions to problems is to mis-represent our predicament, which is at best a process of risk management. What one hears far less of are the implicit risks and uncertainties in such proposals. This is not to say they should not be part of dynamic risk management but that in our present context they cannot be de-risked or outcomes made certain. Just one aspect of this, for example, is massive reflexivity risk, that is, actions to avert a crisis may end up sparking the crisis by causing pre-emptive behavior change. Furthermore to undertake such risk management decisions one needs to understand or intuit the nature of contemporary dependency - what could be lost and how fast it could all happen especially if things go awry - and very few members of the public, politicians and policymakers really do. Or to put it more directly, if you want to do radical surgery on the monetary system, what's your food security planning like? This is particularly acute for anybody trying to do deal with large-scale systemic risk - whatever is done, there are far greater downside risks than upside ones, which understandably makes monetary officials conservative. There's a vast difference between promoting a solution from the side-lines and risk managing an intrinsically uncertain and dangerous process where one might be held accountable for a catastrophe. Even if we were to 'solve' our financial and monetary problems, we'd walk straight into oil and food crises which are systemically de-stabilizing.

Our predicament and the tragedy of attempting change is: given time and resource constraints and the reality that we depend upon a de-localized networked system without central control, how do we change the system while ensuring we do not collapse its essential functions. Decreasing global resilience and the increasing complexity, interdependence, tight coupling and the speed of the processes we depend upon make this a fundamentally uncertain, dauntingly complex and very dangerous set of challenges. So we dig in because we can't dig out. We grasp for growth, we buy time and kick the can, and with each step become more vulnerable.

So the idea that growth is a good or bad idea is a bit beside the point- we're not going to get it for much longer, nor is there much we can do about it.

AA: You don't believe then in a kind of steady-state non growing economy?

Steady-state from where we are now is, according to many ecological indicators, way in overshoot. So if there were to be something like a sustainable steady-state economy it would be in terms of resource consumption far below where we are now. Far, far below. And how do we get there?

For all sorts of reasons the possibility of a controlled orchestrated de-growth to some viable steady-state position is probably deluded in the extreme. I'll just point to one thing, such a view tends to embody the confusion that because the globalised economy is human-made it is therefore designed, understandable and controllable - humans can do this in niches, but the emergent structure of multiple niches interacting on many scales

over time is not. This mirrors the sort of argument made famous by William Paley in his *Natural Theology* who said that the existence of living organisms proved the existence of a divine creator/ designer by analogy with how the finding of a watch would lead one to believe in the existence of an intelligent watchmaker. Half a century later Darwin and then his followers showed that natural selection could do emergent design without a controller- the 'blind' watchmaker in Richard Dawkins words. But as believers in Man's progress we seem to have taken on the role that Paley once ascribed to god- that is, as the creators of the complex globalised economy it is therefore designable and controllable and potentially perfectible if only the right people and ideas were in the cockpit. We find all sorts of confusion arising from this when attempts are made to take linguistic dominion over the economy by confusing complex interdependent emergence with intentional design (as in, the economy *is* capitalist/ neoliberal/ socialist, or, we need to change 'the monetary architecture'). So even without getting into details about irreversibility in complex systems or the myriad practical problems with a controllable de-growth, the power of the belief in its possibility seems, to me at least, to represent Titanic hubris.

That said, a disorderly de-growth/collapse would bring us to a new era where we would end up with a much reduced capacity to access and use resources and dump waste. But we'd still have to respond to problems and that would generally require whatever energy and resources were at hand. For example, anthropogenic greenhouse gas emissions would likely nose-dive, a good thing of course, although the effects of climate changes would continue to get worse because of lags in the climate system while our adaptive capacity compared to today would have been shattered. Thus the real cost of climate change would escalate beyond our ability to pay quite suddenly and much faster than conventional climate-economic models would suggest. The danger here is that in a state of poverty and forced localization our attempts to respond to such emergent stress and crises mean we start undermining our local environments and their on-going capacity to support us. So any form of steady-state economy in the foreseeable future is inherently problematic.

But in time some of us might be able to maintain a simple steady-state economy by acculturating to that new reality, at least for a while. Maybe a world where parsimonious poets and threadbare social nurturers are loved and admired, while an affliction for stuff would leave one pitied and dateless! I'm pretty sure there will people living good, meaningful and ecologically responsible lives long into the future.

AA: If so, cannot we just switch to green growth?

DK: First of all, if it is growth, it will still be energy and resource consuming. Secondly, the starting point will still be path dependent and thus constrained. Thirdly, technology cannot make energy, only help to find, process and distribute what is already there. And what's potentially left, renewable or not, is less economy-adaptive, is of lower quality and lower energy return than what it's replacing. So there is no magic way around our central predicament. Anyway, what do we mean by 'switch'? It suggests a level of insight and control of the globalised economy that we do not have. It implies a rapid transformation that in reality is inherently rate limited (energy revolutions have happened over many decades), and dependent upon the continuing coherence of the globalised economy and its constituent critical systems.

In addition problem solving in a complex society suffers from declining marginal returns. New solutions require more and more scientific, economic and social efforts and

economies of scale and resources. They don't live in a vacuum, they live in this interdependent system- the globalised economy. For example, the smallest particle, the electron, discovered in the 1890's was done by Thompson on a lab bench; now it takes 10,000 PhD's and a 27km high tech ring, and the coherence of our modern globalized economy to reveal the newest particle, the Higgs Boson. The discovery of penicillin in the 1920's in today's money cost almost nothing and had a revolutionary impact; now we are spending €100's of millions to make minor improvements on niche drugs. To 'solve' the problems of growth with green growth still requires the rising cost of complex problem solving- and that requires rising energy and resource flows- which themselves are suffering from declining marginal returns (Energy-Return-On-Energy-Invested).

In the end though, we've run out of time. The implications of crossing the limits to growth are the complex globalised systems (financial, monetary, adaptive social behaviors, supply-chains, critical infrastructures, factories, resource access and processing, R&D etc) needed to invent, manufacture, and deploy at scale begin to stress, lose resilience and finally break down. In such a case our green growth aspirations will fall away from our grasp as the socio-economic ground collapses beneath our feet.

AA: But it is still better to have green growth than business-as-usual?

If we did it right, then investing in some of the things that are considered in green growth plans could help to make us more resilient in the future, but only marginally. Mostly though, green growth is designed for and adaptive with the assumption of continued economic growth and the persistence of system integration within the global economy.

For example, if we are putting renewable energy onto a large-scale networked grid and we hit a crisis because or our financial system fails, say, and the demand drops by 80%, then a lot of that variable supply may end up being effectively useless. One reason is because a certain level of base-load on a grid is needed to support a level of variable (renewable) supply, another is that the network loses economies of scale. In such a scenario it may become just another wasted investment. It would be more resilient if we were to put renewable energy into localized networks, adaptive to variability, resilient to supply-chain breaks, and used to protect something critical for collective welfare such as sanitation. Such an investment would make no economic sense at present, it's completely inefficient.

Again though, I think we've pretty much running out of time for any type of growth.

AA: Obviously, our societies are growth addicted. What is your explanation for that?

DK: Well, there are various perspectives.

We are locked into increasingly complex growth-dependent socio-economic processes and behaviors. These processes ensure we are fed, the lights are on, our water is clean and hospitals are open. They ensure that goods and services flow throughout the world enabling jobs and purchasing power. As the global economic situation deteriorates and our adaptive capacity (savings, credit for investment, government tax receipts, inventories) becomes strained we (as individuals, businesses, countries) effectively have to stay in the game to avoid having to drop out and suffering much greater immediate consequences. We need growth to keep the systems we depend upon working and avoid huge socio-economic risks. Again, we dig in because we can't jump out, losing system resilience all the time.

Within all of this, critical sub-systems such as our financial and monetary system is growth-dependent. Other critical systems and networks are scale-adaptive, for example, critical infrastructure and discretionary income. All are unstable in severe or prolonged economic contraction. Nor should we forget the myths and stories, worldviews, trust networks and casual assumptions that embody expectations of growth.

At a broader level the globalised economy is an autocatalytic system, that is, it creates the conditions requiring its own expansion. It's a self-organizing process, without designer or central control, it's how ecosystems evolve, it's Adam Smith's invisible hand. For example, growing levels of complexity encourage individuals, businesses, institutions and social and political groups towards greater levels of complexity if they are to persist (economically and socially) in a dynamic environment where there is competition for resources, status, efficiency, bandwidth etc. A system with greater relative complexity, scale and resilience means on average a greater likelihood of persistence, but that requires on average more energy and resources. That is, there's an advantage to maximizing power (energy per unit time). This is the connection Howard Odum made between ecology and economies over thirty years ago. On a societal level, this is part of how most of us end up joining a common complexity/ growth ladder (use the internet, supermarkets, airplanes). Growth is in this sense natural - provided you can access energy flows.

Let's give an example. Imagine some friends were to set up an environmentally inspired 'de-growth' organization, the first things they might do is set up a website, a Facebook page, organize public meetings, fly in a specialist speaker, raise campaign funds- that is, pay the cost in complexity and resources needed to engage with a complex socio-economic system where they must compete for attention to spread their message. In doing so they would have added to the complexity of the system as a whole. They would have added a tiny increment to the economies of scale of infrastructures and businesses across the world, thereby supporting their continued investment in complexity. They would have added a yet another sliver of waste into the global eco-system. Growing scale would entail growing fixed operational costs and the need for greater funding. They would shape the world in a small way and the world would shape them as new dependencies and inter-dependencies were acquired.

But the origin of growth is a more fundamental thing than our economic travails. Life evolves traits to persist and reproduce in the long-term struggle for resources. If you look at any species, it's expansionary until it hits some sort of environmental and other species' limits. If you have an old building abandoned for a few years, you'll find grass and trees cracking, and crawling things creeping in through every available spot. Or an invasive species might collapse an eco-system if they had no natural predators. What happens in a quasi-stable ecosystem is that a species meets and interacts with environmental and other species barriers, and some form of mutualized regulation occurs, as one can observe in even simple predator-prey models.

We evolved in scarcity and harsh environments and our instinctual drivers (like desire/aversion, status, in/out-groups, stimulus response, habituation and discount rates) are adapted to that (see Nate Hagens in *Fleeing Vesuvius* for a good introduction). But some 80,000-50,000 years ago we developed the ability to use language which enabled abstract thoughts, learning and sharing, sophisticated social organization and rapid adaptability compared to genetic change. Our ability to solve problems of environment or species constraints was hugely amplified, but this ability was still at the service of our archaic instinctual traits. So we've kept jumping over constraints, more of us surviving and

living better. But the primary limiting constraint, energy, was surmounted when we learned how to exploit fossil fuels. This initiated an extraordinary two-hundred year autocatalytic cycle of desire and innovation, surplus growth and social stratification, complexity emergence and economic growth so that even the warnings of Malthus slipped into memory and the history of failed predictions.

We desire, achieve new levels of comfort and security, habituate to them, feel the anxiety of status or become aware of some new gnawing lack before the cycle of desire returns again. Some 2400 years ago the Greek philosopher Epicurus said:

So long as the object of our craving is unattained it seems more precious than anything besides. Once it is ours we crave for something else. So an unquenchable thirst for life keeps us always on the grasp.

Such an observation is contained within the Four Noble Truths of Buddhism written at roughly the same time in Asia. It is part of our evolutionary heritage, our instincts honed by scarcity and risk which existed long before the advertising industry learned to exploit it. However once we have habituated to something its very hard to lose. Access to a hot shower, a washing machine, surgery, even a television are now considered almost a necessity in developed countries. We barely notice what we take for granted. Almost every environmentalist I know (*Mea Culpa*) who speaks of the need to consume less actually live lives of more-or-less comparable consumption to their non-environmentalist neighbors.

There's an even broader perspective. The growth of complex organization (star, planet, life, human social organization) can spontaneously emerge where there are constrained energy gradients. The existence of such energy gradients, and indeed the arrow of time, depend upon the thermodynamic conditions at the beginning of the universe. Complexity growth is the universes optimal way of finding equilibrium. From this point of view, the emergence of our complex global civilization and its inevitable collapse is just the laws of physics being made manifest through us.

The broad point here is that growth and collapse is a much more fundamental process than capitalism, the debt-based monetary system or technological change, as the history of collapsed civilizations and extinct species can attest. It's part of us, part of life.

People can be uncomfortable with such evolutionary explanations. However, they're not mechanistically deterministic, but statistical, people and small groups will always surprise more than very large human groups. After all coming across a convent of celibates is not a sign that human sex is dead! Nor do such arguments rigidly define behavior. For example, Stephen Pinker marshals diverse evidence (in *The Better Angels of Our Nature*) to show that there's been a remarkable fall in the risk of personal violence that he has associated with rising wealth, globalisation, states and independent legal systems, changing cultures and the expansion of empathy. Of course we remain highly sensitive to the risk of violence, and there's no reason the situation cannot reverse, but he demonstrates we've become much nicer to each-other in all sorts of ways!

But to acknowledge our behavior is shaped by these large-scale processes is to accept our place in the wonderful tapestry of life, of the universe and our place in its story. It's what we share with other animals and allows our recognition in them. It also suggests that as a species we should be forgiving towards ourselves. As a species, as a civilization, we are not bad or evil.

Part II: Anger & Complicity in a Time of Limits

AA: And we also have another kind of growth. That is, what do you think are the key factors behind the growing number of angry people?

DK: Anger is a natural part of being human and can arise because people feel they have been badly treated, a personal boundary has been crossed or they have been denied something. It is also part of collective behavior that can regulate or amplify stress.

We're part of an integrated globalised society hitting financial and ecological limits and this is starting to challenge peoples' habituated expectations. There's been a clear emergence of tensions and anger in many parts of the world since the global financial crisis began. The effects of the crisis, and responses to it have made people angry at the financial sector, governments, the "One Percent", international institutions or capitalism itself. Ecological constraints are being reflected in record food and oil prices. Food prices have always been a trigger of social unrest, in France in 1789 and the year of revolutions in 1848. More recently Yaneer Bar-Yam and colleagues show a strong correlation between the Food and Agricultural Organization's (FAO) food price index and outbreaks of social unrest. This has forced simmering but contained antagonisms to the surface as happened in the Arab Spring.

But we need to be clear, the large-scale predicament and the emergent socio-economic stresses that we are beginning to experience has very little to with fraud, corruption and the greed of a tiny few. It has a lot to do with our human civilization running into limits. As socio-economic stress deepens and uncertainty rises we can expect anger spreading in severity and scale in the coming years. Uncomprehending rage turned outwards and inwards, fantasies of catharsis through revolution, extremism and authoritarianism, aggressive power/productive asset accumulation and scapegoating are just some of destructive behaviors we're likely to see.

The stakes involved in such transitions mean that it's important to interrogate our anger, and question its foundations. That's why I'd argue that in the rich part of the world there has been a huge amount of self-righteous finger-pointing that is not only delusional but may well be detrimental to how we deal with the collective challenges ahead. None of this means, for example, that fairness and inequality (especially in-group) are not hugely (and innately) important for people, and that societies who fail to engage with it in the difficult years ahead are greatly adding to the risk of catastrophic social fractures that will do nobody any good.

As a species we're very sensitive to intra-human drama, and in a time of growing crisis, tend to frame narratives as those who are with us and those against. We claim our own complex introspection, virtue, wisdom, victimhood and understanding, and too easily assume that those with whom we disagree are more stupid, venal and the bearer of grudges toward us. Growing socio-economic stress is systemic, very complex, and far beyond full comprehension for anybody. Decisions can be made with good intentions, but

there may still be unpleasant outcomes and trade-offs. The temptation is to simplify and personify its ill-effects in people or institutions. That if only ‘our idea’ was implemented, the government changed, or the European Central Bank was filled with green-minded, economically astute, monetarily enlightened altruists like our selves, all would be well, or at least a lot better. Now this may be so, or it may not, or it may be that we are just playing out our own delusions.

Governments aren’t doing ‘austerity’ or bank bailouts because they enjoy causing suffering and are tickled pink at the thought of bankers’ gigantic bonuses. Policy is being implemented in uncertainty and complexity, within environments over which there is limited control, and where the potential consequences are potentially far more catastrophic then what has befallen Greece. Choices are constrained and involve risks, uncertainties and trade-offs. Mostly policymakers are acting in good faith. None of this is suggest that we should be complacent about what governments do nor that we should not be forthright in holding them to account.

But it’s good to take some perspective, and even to be grateful although we might complain. We ordinary Europeans acknowledge what we don’t have and look to others who have more, but compared to virtually everybody in history and most of the world today, we have a huge amount. We have habituated to this so the loss of a little of what we take for granted can make people angry. On one side we have feelings about fairness, particularly within our own social in-groups. We are angry say about the one percent (71 million people) but we among the global 15 percent (1.14 billion people) are less concerned by the fact that there are 85% of population below us, and half of them don’t have access to basic sanitation. Remember that in earnings terms you join the global one percent when you earn about €40,000- how many globe-trotting radical activists earn less than that? And if you get unemployment benefit in Ireland you join the global 15 percent , with the additional benefits of advanced health-care and high levels of security and freedom (in historical and modern-day relative terms.) So here we are talking about something very human and indeed ‘animal’- relative status, in/out-groupings and habituation.

As societies face increasing challenges in the years ahead, and governments and international institutions fail to hold together our web of expectations, we can expect a lot more anger and more people feeding it. Some form of dis-orderly economic contraction is almost certain and nothing will change that. As economist Colm McCarthy noted, anger is not a policy. In fact we know very little about how a society might practically and dynamically furnish large and bewildered populations with the basics of food, healthcare, critical services, security and governance in the context of a complex society falling apart.

Anger can be a positive force for change, a motivation and lever to prize open vested interests and ensure a level of fairness within a society. But it can also be an addictive and narcissistic form of social bonding that feeds upon itself; narrowing the field of empathy, foreshortening the range of options, encouraging disastrous simplicities, turning people and groups into cyphers, all while offering the easy comfort of certainty and righteousness. At its worst, especially in times of dislocation, it can turn into something violent, while inviting and even finding meaning in violent response; sucking oxygen from the middle-ground, undermining societal trust, absorbing scarce resources, and sowing the seeds of prolonged antagonisms and psycho-social fractures.

Usually we can notice these traits in others, and even take a righteous pride in pointing it out; the moral challenge is to tackle it in ourselves. And Europe’s history provides enough warning that it’s a beast we feed at our peril.

AA: So we are the same as those 15, because we are complaining about them while ignoring those below us.

DK: Let me put it in a jokey and anachronistic way. We are the global haute-bourgeoisie railing against the global aristocracy while claiming the mantle of the global proletariat. It allows us to feel righteous while skirting the issues that make us complicit.

AA: So we have no moral rights to be angry?

DK: We will be angry or not as the case may be – irrespective of the intellectual or moral veneer we give to it.

Anyway, who are we angry at, the "One Percent", or fraction thereof? Most of their financial wealth is based on abstract future promises that cannot be turned into goods and services except at the margins. A lot of that wealth is financial, where total observable global financial wealth has a value of about 350% of Gross World Product – if the wealthy tried to convert their share of this into money the value would vaporize (who would buy the assets?). And what of the £50 million Belgravia mansion and the Old Masters collection? These are sometimes called Veblen goods, they are goods that are desirable because their price is high, and they are usually relatively unique and made from resources produced long ago. Again if the rich tried to sell at any scale, the price would crash. But let us imagine the super-rich, by desire or because they were forced to, could sell off their wealth getting say 3 time GWP in ready cash to help the poorer world, it could still not increase the flow of goods and services produced in the world except marginally (assuming the resultant inflation did not turn the economy into a tail-spin) – to do that requires the energy, resources, and the coordination of a complex socio-economic system that is already straining at these limits.

What's more, if all the super-wealthy's personal resource and energy consumption was shared per-capita over the world it would barely register; there's too few of them and anyway after the mega-yacht and a couple of car collections and running a few homes, more energy and resource consumption just takes so much, well, work! For example, there are 60,000 ships of weight greater than 10,000 tons in the world, a little time on Google should convince you that there are only a tiny number of personal super-yachts this size – it's a mere statistical blip on the total number. Most of the super-richs' wealth requires almost no resources in global terms, it's just abstract status markers.

This is why when Oxfam say that the richest 100 people have enough wealth to end global poverty four times over they're being deeply misleading. They confuse real wealth with virtual claims on wealth. To end poverty would require massive investments in resource-intensive infrastructures (energy, water, waste, roads, telecommunications); food (more fossil fuel based pesticides, fertilizers, drainage, irrigation, storage, logistics); housing; healthcare (hospitals, clinics, drugs, equipment, training), and education. This would add a huge requirement for energy and resources on top of what we are already using, which is at a limit.

The only possible thing we can do globally to provide investment energy and resources for the poor is to take it from the richer world of real resource use, not the piles of paper and electronic promises. And those resources are used in our food, clothing, healthcare,

sanitation, cars and holidays, electronic devices, books, light and heating. Behind these personal goods and services are complex infrastructures, factories upon factories, shipping and airports, schools and civil administration etc, all across the world. To significantly lift the real poverty of the global bottom third would require that at least the global 25% would have to undertake a massive drop in consumption, which would affect even people on social welfare across Europe and in an interdependent world cause disruption across the globe, even for poor people. However, I mentioned that our complex socio-economic system is growth and scale adaptive. That means that a withdrawal of consumption of such scale would most likely cause a largely uncontrollable and systemic collapse of the globalised economy. Energy and resource use would collapse (80, 90%??) and so to would the system integration in the globalised economy, but this is what would be needed to manufacture and deploy poverty alleviation measures for the global poor, which would now include everybody!

Of course status matters, it gives one power, for example, as does fairness. And inequality has many negative correlates. But I suspect the super-wealthy's expectations are far more vulnerable then they or most people think- there'll be very few chances of the latifundia (landed estate) styled opt-out that shielded the Roman elites as their empire faded.

Energy companies? Well, if we don't want the companies (or global corporations in general), and the waste produced by the energy, resources and manufacturing associated with renewables and fossil fuel systems then all we need to do is stop consuming. And as the world's grade A consumers we've lots of scope (what Ireland spends on alcohol is equivalent to the GDP of Kyrgyzstan which has a similar population; what UK women spend on cosmetics is equivalent to the GDP of the Central African Republic). Indeed if the relatively small group of developed world environmentalists, anti-frackers, Occupy Wall Street supporters, and the righteous revolutionaries of Facebook slashed their own consumption, stopped having children and destroyed their saved income, there is a fair chance they could tip an already vulnerable global economy into a spiraling depression that would collapse energy use, energy companies, greenhouse gas emissions, resource use, habitat destruction, and all this would result in catastrophic suffering. A similar argument was posited by David Holmgren recently in his Crash On Demand paper.

What of all those hindering efforts on tackling climate change? Firstly, if one wants to cut emissions, stop consuming, then there's no need to convince governments or corporations – only some of your fellow citizens. If you're worried about climate change deniers, stop feeding them with the attention they thrive off, and anyway, since when have governments needed a full consensus to do anything? There's pretty broad agreement both politically and in the corporate world that climate change is a real risk. At issue is the cost, and companies and governments will not pay the costs of reducing emissions if it loses them competitiveness or undermines economic growth. What company will put itself and its employees out of work? This is especially critical when governments are trying to drive up GDP to stave off rising social pressure and stop the financial system falling in upon everyone's head.

There have been estimates that the cost of reducing emissions to 550ppm CO2eq would be about 2 percent of GDP per annum (Stern, revised estimate). Others have said it would cost almost nothing. An essential problem is that economists don't know how to model energy nor do they understand the system dynamics of complex systems. (One notable exception of the former is Michael Kumhof's group at the IMF which has developed a more realistic energy-economy model to look at peak oil, but as they accept, it cannot describe large-scale effects). If you wanted to reduce global emissions by, say, 3 percent per annum and ensure the world's poor can afford some energy (assuming you could get

agreement for it) then you could use a system such as the Feasta-developed Cap & Share. However, I suspect it would never work. Forcing that much carbon at that rate out of the globalised economy would be equivalent to forcing a peak and decline in energy on the economy, and increase global food prices. That would enforce economic contraction. Again, such a contraction is unstable, it would probably collapse the globalised economy within a few years and in the process destroy the whole system of caps and permits. What are the odds of any democratic state agreeing to the instigation of such a calamity? Most of what we talk about when we discuss policy around climate change is tangential to the real issues, which suits almost everybody; activists, deniers, the public, governments, the UNFCCC and so on. As I mentioned at the first part of the interview, emissions are likely to drop very significantly anyway because of the effects of debt deflation, financial/monetary shocks and peak oil.

In a similar vein, one of the many privileges we Europeans have had is not having to suffer the massive consequences of the necessary (because of the laws of thermodynamics) wastes, dangers and environmental destruction that comes from our grade A consumption. That's mostly fallen at the feet of people much poorer than us and with far less freedom to adapt. So, for example, if we protest against wind turbines or fracking (the final flicker of the fossil fuel age, with little time left to run), yet we do not slash our own consumption or acknowledge our complicity, we're not protecting 'the' environment; we're protecting 'our' piece of the environment, the accustomed privileges of our first world in-group. There's little to be holier-than-thou about.

Politicians? They're human, imperfect and sometimes delusional, elected by the very same. What do we expect them to do? One can command the moral high ground by saying we want sustainability and we want our basic European standard of living and we want global equity, but not only is it impossible from a bio-physical economics point of view and dubious in terms of how people actually behave; it's the active cultivation of avoidance and delusion. If one requires of politics the maintenance of our habituated expectations, the control of uncertainty, and the ever-rescuing hand then all politics will fail you.

All this looks like hypocrisy, but we should be gentle with ourselves. As evolutionary psychologists such as Robert Trivers and Robert Kurzban have explored, social interactions are exercises in impression management. In such situations being considered altruistic and caring towards others is a valuable trait; we're considered part of an in-group, somebody worth having around in a time of need, and we get to share the benefits of cooperation. But we are never perfectly altruistic. Behavior that encouraged a person to treat her own welfare and that of her children or community as equivalent to an unrelated stranger elsewhere would be whittled out of existence by natural selection. Rather, in social situations we practice hypocrisy, which is the free-rider's solution of how to appear altruistic while behaving selfishly. The best way to convince others of our earnest virtue is to believe it ourselves. Cognitive dissonance is the occasional cost of this mental separation of beliefs and actions. However, within our own interest/ in-groups you'll usually find the members don't allude to such complicities, which is one of their benefits.

Recognizing these somewhat uncomfortable truths will be profoundly important. As we face the challenges ahead, an acceptance of our complicity and a degree of humility will serve to soften the wider societal conversation that we desperately need to have. Righteously focusing all condemnation on small, albeit influential, groups, signals to the wider public that our predicament could be solved if only the targets were as virtuous and wise as their critics. This is balderdash! Whatever the arguments about bankers, energy companies and climate change deniers, they're marginal, mere froth relative to our

collective responsibilities and challenges we face. We are a complex civilization in over-shoot and we should be grateful we've had pretty much the best of it.

The limits to growth are likely to be expressed through financial and economic stress, then disintegration, meaning that the ecological constraints that are at the kernel of those limits will be obscured to most. If all that happens is that people end up blaming bankers and politicians we will have lost the most crucial insights that we need to carry on; the meaning of dependency and inter-dependency and that we must care for and nurture the environment which sustains us. We may also in our rage and righteousness end up replacing our imperfect political institutions with rotten ones- John Michael Greer's excellent recent series on Fascism gives a narrative insight into such processes.

Our best hope for going forward is learning to let go, and part of that is letting go of anger and delusion. Much of the current finger-pointing is fundamentally conservative as it seeks to maintain an impossible status quo, even if it waves a radical banner. But the big conversations we need to have are with each other. And for that we're more in need of wounded healers (grateful, uncertain, compassionate, complicit) than raging prophets.

AA: But if you lose a job, lose your income…

DK: In the broad sense, that's life! We're a species in overshoot. We 10 percent have had the best slice of the global cake. It's only unfair if you think your expectations are a right or that they are owed to you. But by whom? It is all conditional on the historically contingent self-organized viability of the globalised economy and the resource flows that it required. Those conditions are coming to a close and no group of rich, no companies, no central banks, no politicians, no community efforts can change this.

So yes, jobs, incomes and world-views will be shattered. Of course it's sad, but we just have to learn to accept it, to let go. The more exciting and necessary part of the debate is how do we respond to those changing conditions? Can we learn to live with uncertainty and loss? Can we creatively adapt and fashion new expectations that honor the best of human aspirations? Can we support each other for the common good? So one might ask, are the newly unemployed merely victims, or have they been given an opportunity to be a pathfinders and guides to the many who will follow them. How then can they be supported in this?

AA: What do you think are the key necessary conditions for a sustainable future?

DK: We need basic food, water, shelter, security and communities where our voices are heard and respected. If this can be done without undermining future welfare, than we're on our way. Once basic needs are supported, and if we're as wise and brilliant as we think we are, then we shouldn't need more stuff to keep us happy and entertained. Our need for status, for example, can be found in much more ecologically and socially supportive activities.

If you have any estimation, when do you expect peak population globally?

DK: I do expect there to be a peak in population, but not like the UN scenarios. Our complex globalised economy has massively expanded the human carrying capacity of the planet, while at the same time undermining the planet's ability to support us without the

globalised economy. If that globalised economy suffers a major failure – and I think this is likely in the coming decades – a chasm will open up between our real needs and what is producible, accessible and affordable. The recurrent mortality challenges of human history: famine, disease and conflict are very real risks. I think in complex societies the risks of hunger and disease are greatly underplayed and the risks of violence probably overplayed by commentators.

But this is part of our challenge; how we set the conditions for better outcomes. In the end our dependencies will be largely localized and that will shape a huge range of differing ecological and environmental conditions that different communities and regions have to interact with. After that, there's a choice about who we are, how do we prepare and whether we go forward wisely.

AA: Do you think we can reduce the consumption of fossil fuels say by 80-90% by middle of this century?

DK: Well, I can see how it will happen (an 80% drop brings us to a level of world energy use mid-twentieth century). But it is not because we have collectively decided it, rather because circumstances have brought us there. And this is a possible global scenario that we may not have to wait until mid-century to find out about.

AA: Do you think that the large-scale behavioral change towards sustainability is possible?

DK: Circumstances will lead behavior. And how our behavior adapts to circumstances, that will vary. That is where there are fields of different possibilities.

AA: What is your carbon footprint?

I would say it is quite a bit below the average for Ireland, but well above the average globally.

AA: What was your biggest professional mistake?

DK: In the early day of this type of work I felt the need to warn the public, politicians and policymakers; so I did – in Ireland and elsewhere – but it could be soul-destroying. I really think I shouldn't have bothered, for various reasons – though this is not a criticism of people. Now I prefer to work with those who have already made the part of the journey, who are already interested and concerned.

Most cringe-making is my inability to edit my own work. Too often I've sent out publications only to receive an inbox full of fury about my spelling, missing words, inverted words, grammar calamities, mixing up left and right, positive and negative. Of course this doesn't help my credibility! I've had dyslexia and a little still lingers. I'm better behaved now and get things edited by someone else….but something always escapes!

AA: What kind of the world do we live in?

DK: Always immanent, revealing itself. Ultimately, neither good or bad. But I feel it to be beautiful, profound, improbable…. one can't be a pessimist about the universe and our place within it. I'll walk into the city now, along the canal under drooping trees where families feed swans – wallowing in the habitual and the banal – as the poet Patrick Kavanagh wrote about this very walk. We live in the day, in each footfall, in the breeze on our skin and the people we meet. There's no need to worry about the future, the world we live in is more than enough.