IChemE100 Transcript Summary
Tom Burke talks to Past President, John McGagh

Tom Burke CBE is Chairman and Founding Director of E3G, Third Generation Environmentalism (Environmental Think Tank), an Environmental Policy Adviser and a university Visiting Professor. He played a leading part in establishing the European Environment Bureau for nearly two decades and was the Secretary-General of the European and North American NGO preparations for the Rio Earth Summit.

Burke has been a professional environmentalist for 30 years and was formerly Executive Director of Friends of the Earth. He has written and broadcast extensively and coined the term 'green growth' in 1987. In 1993, Burke was appointed to United Nations Environment Programme's Global 500 Roll of Honour. In 1997, Burke was appointed CBE for services to the environment.

Editor's note.

This was a very expansive interview and the below has been chosen to tease out identified key theme.

The themes of the interview teased out policy, political and social-system tensions that emerge to hold back action on critical planet ecosystem challenges.

Key messages/themes distilled from narrative.

The Anthropocene-era?

- A future-shaping model taking us to is that of the Anthropocene. It needs to be stressed that this is not a model accepted by Earth System Scientists
- The Anthropocene essentially argues that what is going on in the heads of 8 billion people and their actions/aspirations (today) are part of an Earth (shaping) system. This is an important concept for the future and what future Chemical Engineers will face.
- In the 20th century we un-locked the secrets of the nucleus of the atom and we then unlocked the secrets in the nucleus of the cell; in doing so we unlocked the keys for humanity to operate on both a geological and an evolutionary scale.
- I do argue Humanity is part of the Earth shaping system – the Anthropocene era. We are all part of humanity, so this frames a Global challenge, and our political systems struggle at the Global level.
- One manifestation is that today "everybody's" into climate change, however the human caused perturbation of the phosphorus and nitrogen cycle is bigger (than the carbon cycle). Ocean acidification is possibly the largest human impact, but it is not really talked about. We should also consider freshwater availably and use.

- An important matter for Chemical Engineers is the impact of what I call persistent organic chemicals because we simply don't know the tolerance of the Earth system is for what is essentially an industrial waste.
- Plastics are but one manifestation of persistent organic (and man-made inorganic) chemicals.
- For scientists and engineers and for everybody there are choices we can make to start dealing with the range of (the above) practical problems, but we have not begun to think of the problems in terms of cultural choices.
- Steve Bannon said something that's important (I feel sure it wasn't original) he said <u>all politics is downstream from culture</u>.
- What we do to address the (Anthropocene) challenges has much less to do with technology, it will be driven by culture as it flows through the political and policy systems.

The Future - the shaping impact of the recent Pandemic

- One of the techniques we can use in handling future projections rests on how you (we) pick up weak signals from the noise.
- Economics, is essentially an extension to decision theory, as a discipline it will struggle to pick out the signals from the noise until too late (Pandemic example)
- If we fail to tackle the very significant Global environment challenge it will be because of political failures rather than technical or technology failures; what's extraordinary is there is practically no systematic study about how political decisions get made.
- We have an array of policy options to deal with climate change and most of the other big problems we face, but they fail to be actioned for political reasons because political decisions are shaped by the need to hold and grow political power as opposed to enabling good policy.
- The Covid-19 pandemic has created 3 global shocks, this will shape the context for future debate for an indeterminable, but certainly significant time into the future.
    - **Firstly**, a heath shock, which with a bit of luck will be over in one possibly two years.
    - **Secondly**, a deep economic shock and this is going to take a long time to recover from (perhaps a decade)
    - **Thirdly**, most importantly, a Global psychological shock and this it will last in people's memories long after the other two have passed
- This is a first for the planet because we "all" know about the pandemic. There are 4 billion mobile phones in circulation and all 8 billion of us know about this pandemic. This is the first time there's ever been a problem for humanity at which all of us have faced the same problem at the same time.
- I don't know what this means, I just think that's a very important substrate when we think about trying to anticipate the future.

Shaping concepts - Freedom TO, Freedom FROM, Innovation and Incumbency

- When we consider decisions that society must make to address global (environmental) challenges a good framework to use is to consider Freedom TO v/s Freedom FROM as a basic political stance.
- Libertarians think Freedom TO. His has been a sustained political effort over 40 years run largely out of the US but Globally extensive in its grip. Freedom TO is demonstrated and evidenced in the protests about wearing facemasks. Freedom TO (live my life the way I want to) does not deliver Freedom FROM (pandemics, sea-level rise, temperature increases etc.)
- From now to the end of the century Freedom FROM needs to be a policy shaping prerequisite. We had better prioritize Freedom FROM or you won't be Free TO do anything, this will be hard. I observe that none of the political conversations that I know about are conducted in this register
- The second shaping tension is one of INNOVATION v/s INCUMBANCY. We are not going to solve the Global problems that we face without massive innovation but enabling this innovation will face significant resistance from Incumbent systems.
- Multi-dimensional innovation will be required, not just (critical) technology or economics but also political, methodological, cultural, and institutional.
- It's a huge Innovation challenge to enable the transition we must make at a Global scale. It is much easier to define the challenge than it is to even begin to think about what we must do to make it happen.

Competition and Cooperation, I Believe v/s I Know

- An important battleground is between cooperation and competition.
- You can't have innovation without competition, over the last 50 years competition has escaped from the boundaries of cooperation, this undervalues the impact that competition can/will generate.
- A big challenge is to sit competition inside a wider cooperative framework.
- Competition breaks new ground, innovates open spaces up for new solutions. But we must work on how we restore the mechanisms of cooperation to best embed the results of competition. In terms of our Global rules-based system we have not be overly bothered investing any effort in this because for the last 40 years we grew like gangbusters.
- A fantastically visible shaper of policy can be seen now in the pandemic, this being public-policy decisions made using either KNOWLEDGE or BELIEF.
- Arguably in the most recent US election around 70 million people voted for a system based predominantly on Beliefs, this was almost 50% of the population.

- Beliefs cannot provide a solution set for the wide range of interrelated earth-cycle challenges we face, the solutions will be built from knowledge, this is the world of the scientist and engineer Chemical)
- The danger comes from political systems that choose to accept belief as an organizer of policy, not knowledge.
- If we do not resolve these cultural tensions, it is not worth worrying about if either the temperature increase will stay below 2 or if the population will reach 9 billion or 11 billion; earth systems will shape these outcomes.

Democracy, valuable mistakes and (equitable) growth

- Winston Churchill was right to say Democracy is the worst form of government except for all the others. He didn't explain why.
- The reason is that despots must destroy all the machinery in which you learn from your mistakes to retain political power.
- Democracy provides the "only" way you learn from your mistakes.
- If you look at this problem-set we face we will make many mistakes as we strive to address the challenges, this is ok because the democratic system allows us to learn from them and the rule of law enshrines critical checks and balances.
- It is right we ask how we do this and maintain social cohesion? We need to accept that people are not going to give up rising real incomes, so we had better develop an economic growth solution. Whatever label you put on this we will not be able to redistribute wealth to eliminate inequality, we must grow our way out of inequality and that is a very big task.
- Using a JFK approach ask do not ask what democracy can do for the climate, rather what the climate can do for democracy. This is probably the best opportunity we have.

Facts v/s Stories. The Art of Communication (for engineers)

- I have no confidence with the facts. I don't remember them; I don't think I am unique.
- People get embarrassed if they don't remember facts to support an argument, facts are a devalued currency. They know (other smart) people are out to fool them with facts, this is part is why knowledge v/s belief tensions are rising.
- People believe what happened to them, even if what happened to them was <u>happening in their imagination</u>.
- They don't trust themselves with the facts and there are too many of them. This illustrates a failure of trust in the facts that "rulers" provide to the wider populous.
- Look what happened recently in the USA; you have a bunch of armed guys turning up at the Madison Wisconsin State House wanting to kidnap and kill the State Governor because she told them to wear facemasks, facts about the pandemic and the protection facemasks provide do

not matter; belief in Freedom TO dominated, this is not isolated however it is in many ways the norm.

- For (you) Chemical Engineers who deal predominantly in the world of facts you had better take notice of this, facts can/will not win the argument, but stories can move people, how do you tell your stories when for some you are "The Devil", I will explain later.

The Medieval Mind is Alive and Well – Beware the "Devil"

- In medieval Europe people really believed in the devil and the devil was out there, but was it (he) visible?
- He was out to get you when he got nasty, but nobody knew anybody who'd ever been "got" by the devil. However, everybody knew somebody who's third cousin was got by the devil – this is a form of dominant mythology.
- You are dealing with mythologies and Chemical Engineers and Chemists need to communicate in the face of a similar (modern) mythology.
- No matter how much good Chemical Engineers have done over the last 100 years through their research, work, and the industries they support a section of society will think about you using a form of the "devil is out to get you" mythology. The nasty things chemicals do to people will jump to top of mind, plastics clogging up the waterways and ocean, chemicals that cause cancer etc. will surface quickly. Facts will not by themselves break through these mythologies – to engage you do need to build the skills of great storytellers.
- People all have individual experiences, and you don't have to persuade them, they persuade themselves because stuff happens to them, and they make sense of it. Think engaging with stories and leadership not a deluge of facts.

Storytellers can achieve the seemingly impossible

- I am going to get you to think about the building of Stonehenge as my way of illustrating the power of storytellers.
- Some five thousand years ago a bunch of people we would call subsistence farmers lived in relatively decent part of Southern England we call Wiltshire.
- They were beset by enormously difficult problems, wild beasts, raiders, illness, pathogens, and failed crops – these were forces they could not control.
- So, one day some dude it turns up and he says; I've got a story for you. Let us walk 150 miles northwest and we dig up really big stones then drag them back and put them up in a circle - then we will be able to manage all our problems.
- This must have been great storytelling. The challenge for the Neolithic people would be on a cultural scale compared to what we're trying to do with climate change today.
- They could not have built Stonehenge using coercion because it takes too long to coerce people into doing something on this gargantuan (for them) scale, nor could you bribe them because in

those days as subsistence farmers there wasn't enough surplus in the economy for the scale of bribery that would have been required.

- Someone had to persuade them, but what do we use as a way of persuading people? Normally we use stories - that's how you persuade. I'm sure it was probably religious in some way; it could have been a religious story that persuaded people to align their efforts into doing something quite extraordinary.
- Storytelling is not a stream of facts. It is evolving culturally resonating stories that capture imagination and these always emerge from a specific cultural reference.
- I conclude that this is something we need, modern cultural stories to take us to a place where we can then effectively use our vast technological resources to tackle the seemingly impossible "Anthropocene" challenges.
- Chemical Engineers could have tremendous impact if they can combine storytelling skills with their unquestionable technical prowess, in doing so the profession would help the whole globe move forward and tackle the challenges and take the planet to 2100. This is not an option; we must tackle these challenges because the downside risk is just unthinkable