

FUTURE NEWS

TO CONNECT, TO INFORM AND TO INSPIRE

IN THIS EDITION

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Possible Pathways to 2025

Dr Peter Saul, Futurist

Over the next few years, a number of critical global challenges will have significant influences on the particular path the world takes into the future of 2025. Key among these will be the currently unfolding global financial/economic/currency crisis. Other possible “gateway” challenges over the next 5 years that could influence the path that the world takes into the future of 2025 include climate change, a killer pandemic, piracy and terrorism, or the emergence of a rogue nuclear state. Several possible pathways to four global scenarios for 2025 are shown below.

“Me First” Response to Crisis

Despite early cooperative rhetoric by nations around dealing with the global financial crisis, the failure of global initiatives subsequently leads many countries to act in their own self-interest.

Crisis Brings Nations Together

The global nature of the threats associated with the financial crisis leads to the formation or strengthening of institutions of global governance. This success fosters greater understanding and trust among nations.

Drawn Out Global Depression

The “Great Recession” becomes another global depression and the global economy struggles for another 5 years or more. Nations compete to form expedient bilateral and regional agreements that contribute to short term survival.

“Winners and Losers”

Energy exporting and “hard-asset rich” countries and those with low public and private sector debt are relative winners. Assets in these countries are in demand by China and others wishing to reduce their \$US reserves and enhance resource security.

Shift to Broader Measures of Progress

The global financial crisis leads to reassessment of how to best manage the global economy. Nations collectively move to manage their affairs in a more balanced way towards an economic, social and environmental “triple bottom line”.

Global Economy Soon Recovers

Effective, coordinated global action stimulates the global economy and financial and economic systems are successfully rebuilt within 2-3 years. National growth paths return to their expected long term trends. The value of globalisation is confirmed and the process continues.

Fractured Communities

Global, national and regional communities fracture as they struggle to survive the economic depression and the failure of trusted institutions.

Managed Tensions

Relationships between nations are managed but many tensions remain around access to resources, ethnic and religious differences, wealth inequalities, demographic growth rates, and the disruption caused by climate change.

Governing Beyond Markets

Global governance is based on new national and international governance mechanisms that have a wider stakeholder involvement to ensure that markets sustainably serve the multiple interests of society and the environment rather than just shareholders.

Improved Market Structures

Global governance is primarily based on more effectively controlled markets under enhanced international monitoring processes.



Fractured Governance



Governance Smorgasbord



New Global Democracy



Global Markets

Possible Pathways to 2025

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Scenario 1 Global Markets

In this scenario, the challenge of returning the global economy to health forges greater cooperation and mutual understanding between nations. Leaders realise that their countries' economic well-being depends on the wellbeing of global markets and global economic governance mechanisms. Bodies such as the United Nations, the World Trade Organisation and the International Monetary Fund are strengthened. New international forums such as the G20 become more effective and eventually restore a workable level of confidence in global markets.

Early in the scenario, as global economies continue to falter, voters around the world push governments to protect jobs and part of the strategy for doing this is to discourage migration and foreign investment. Large corporations push governments to protect their interests – even at the longer-term cost of the environment or the wider community (e.g. bail-outs to manufacturing and construction industries; and continuing subsidies to agricultural regions made uneconomic by climate change).

Markets deliver very positive outcomes for some but there is a growing divide between the haves and the have nots.

Governments, business and community groups attempt to manage the tensions and market failures at the global, national and local levels by building increasingly complex sets of rules, regulations, monitoring and compliance machinery.

In this scenario, governments have largely given up trying to proactively prevent systemic problems arising because they know that cooperation from others (including their own constituents) will only be token. So, issues are dealt with reactively as they arise – and people mostly then strive to look after their own interests.

There is growing distrust of governments that leads to resistance to raising taxes to pay for social benefits such as public health and education. The private sector moves to take a larger role in these areas as a result. This seems appropriate in a world where relationships are (often reluctantly) accepted as typically transactional and where markets rule.

Scenario 2 New Global Democracy

In this scenario, the GFC and climate change bring nations together in new governance forums in order to deal with problems that cannot be addressed by nations working independently. It becomes clear that pursuing self-interest in a globalised world only invites retaliation and continuing (expensive) conflict. Initially, peace is simply seen to be cheaper. However, trust gradually grows from there.

The success of cooperative efforts at the international level reinforces and is reinforced by new democratic governance mechanisms that are emerging at the corporate and community levels. Sustainability, triple bottom line, closing opportunity gaps, and social networking technology are ideas and forces that increasingly drive people

towards more participative governance mechanisms. They also reduce social inequality.

We see many more reviews, consultative conferences, and community cabinet meetings in the search for “win-win” policies, solutions and decisions. This slows down decision making but speeds up implementation.

Regulatory negotiation is common as NGOs, industry groups and regulators work together to set standards and lower barriers to the movement of people and ideas.

Individuals become more actively involved in activities beyond their work. Work-life balance comes to mean more than work-leisure balance. People become engaged as active citizens, neighbours, and members of professional, developmental and social groups. This trend when combined with government's preference for participative governance mechanisms leads to state authority diffusing downward to a host of local institutions, NGOs and community groups. It really is “government by the people, for the people”.

Scenario 3 Governance Smorgasbord

In this scenario, energy exporting and “hard-asset rich” countries and those with low public and private sector debt are relative winners. Assets in energy rich and resource rich countries are increasingly in demand by China and others wishing to reduce their depreciating US dollar reserves and enhance resource security.

Possible Pathways to 2025

Dr Peter Saul, Futurist

Countries seeking scarce strategic resources (such as oil, gas, uranium, rare earths, water, cheap workforces) are forced to reassess their stands on things like the environment and human rights and make deals with the countries that control the resources they need. Resource rich countries such as Russia and Iran become more assertive in defending their own national governance mechanisms and political cultures and are much less likely to see Western democracy and de-regulated markets as the best path to prosperity, economic growth, and social stability.

In this scenario, we see growing global diversity of national and state governance mechanisms with the leaders who control strategic resources being more confident that they can do things their way. After the hardships endured during the Global Financial Crisis, voters in many democratic countries and the growing middle class (and middle class aspirants) in most non-democratic developing countries come to prefer prosperity to traditional democratic rights and freedoms. Therefore, undemocratic leaders (e.g. in Africa) who are able to leverage rich natural resource endowments gradually gain popular support and are able to strengthen their grip on power.

Over time, the commercial imperative of having to deal with diverse cultures and forms of national governance leads to greater tolerance and mutual understanding in some nations while others that are in a position to do so persist in trying to get what they want by threatening military intervention or offering military

protection against the (real or manufactured) threats posed by others.

Some nations invest heavily in more expensive local sources of supply of strategic resources and their substitutes. This slows their rates of economic growth but is accepted as an important part of the national security strategy. It has come to be seen in the same way as national spending on defence.

Scenario 4 Fractured Governance

In this scenario, the global efforts to deal cooperatively with the Global Financial Crisis (GFC) end up being more rhetoric than reality (as in 1930). The GFC morphs into a protracted global depression.

Weakened international institutions, including increasingly under-funded bodies like the UN and WTO, provide little discipline to control the tendency of nationalistic governments to lean towards “beggar thy neighbour” policies. Across many realms where reciprocal action among nations is the key to success (as in the management of the GFC and climate change; and food, water and energy security) worldwide policy efforts flounder.

In the absence of strong multinational agencies of global governance, bilateral and regional alliances and trade agreements are entered into by governments and national bodies in areas of mutual national interest.

Increasingly desperate voters around the world push their governments to protect jobs

at all costs and part of the strategy for doing this is to discourage migration and foreign investment and to impose trade barriers and “buy local” incentives.

Standards, laws and procedures that are relatively inflexible and widely divergent across jurisdictions translate into high compliance costs and are also significant non-tariff barriers to trade. Global mobility of people and money is seriously hampered.

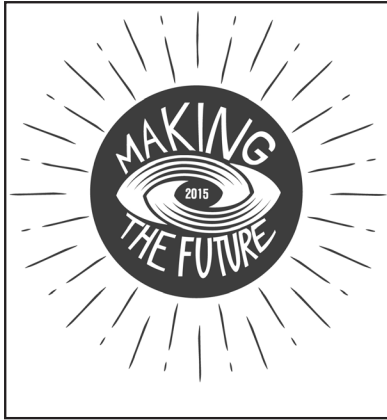
Large corporations and other entrenched power groups push governments to protect their interests – even at significant cost to the environment or to the wider community (e.g. bail-outs to manufacturing and construction industries; continuing subsidies to agricultural regions made uneconomic by climate change; and the indefinite postponement of the Carbon Pollution Reduction Scheme and carbon pricing policies. Businesses with strong national identities (e.g. Qantas, BHP and the Big Four banks in Australia) fare well and are granted state protection through subsidies and the tax system.

Markets become increasingly distorted as politicians (and executives) try to favour their allies and constituencies. There is a growing divide between the winners and the losers. In reaction, populist protest often turns violent with strikes and demonstrations increasing as disaffected groups assert their agendas. Blaming foreigners, minorities or elite groups (e.g. for taking jobs and other local opportunities) is increasingly politically appealing.

FUTURISTS IN ACTION

Report on the annual conference of the World Future Society held in San Francisco

by Charles Brass



A slightly larger than last year group of futures foundation members have just returned from attending the annual conference of the World Future Society. In San Francisco they joined over 800 others from 25 countries in a two day conference entitled “Making the Future”

Some of our group also attended one of the twelve full-day master-classes which preceded the conference. These included sessions entitled: “Rigorous Futures – Learning how to harness logic, creativity, systems thinking and intuition: and “Would you like to play a game – a facilitated introduction to using and developing foresight gaming systems”.

The conference itself included three plenary presenters (Steve Jurvetson, a Silicon Valley venture capitalist whose presentation was entitled: “Forging the Future – How Technology Disrupts Everything”, Gina Bianchini, CEO of Mightybell which includes a sophisticated professional network for teachers, and Ari Popper from SciFutures who talked about how he helps corporations create the future using science fiction) and 11

concurrent sessions with a choice of at least 5 options in each session – for a total of over 125 presentations.

For a more comprehensive report on the conference members are invited to contact the futures foundation office. In this report we will focus on themes relevant to the bulk of futures foundation members who come either from secondary schools or from local government.

By my count there were seven sessions focusing specifically on education, not mention an entire theme called: “millennials and youth activities” which included two different groups of high school students talking about how they explore the future in their classrooms.

Conscientious readers of Future News will remember the lead story in the April 2014 edition by Peter Bishop who has created: “Teach the Future” since his retirement from the University of Houston. Peter and some of his students presented at the conference, as did students from the Singularity University and faculty from the Institute for STEM education in California.

The significance of education at this conference is perhaps best demonstrated by the response of keynote presenter Gina Bianchini who, when asked what was the biggest change she wanted to see in the world, answered: “more respect for teachers”.

Foresight in local government was a focus with sessions such as: “Design futures for human centred cities”, and “Neighbourhood Governance a plan for the future” being



Gina Bianchini

among 8 sessions run by local government practitioners and those futurists with whom they had worked.

One particularly impressive example

came from Tulsa Oklahoma whose Vision 2025 project began in 2003, and from where practitioners reported on how they were both ensuring that the vision was kept alive and that progress towards achieving it was being monitored and reported on (more details on this project can be found here: vision2025.info).

The scope of sessions was again very broad (ranging from a practical display of Futuristic Robots, through “The Future History of God”, to “Pixels and Ploughs – the future of Food Deserts) and participants could also choose to attend two site visits – one to the home of the Long Now Foundation (www.longnow.org) and another to Plethora, a high-tech manufacturing facility (www.plethora.com).

Those from Australia who attended (which included four others who were not part of the futures foundation contingent) agreed that the conference had been worthwhile, not just because of the formal content but mostly because of interaction with other attendees.

We are looking forward to hosting an even bigger contingent to the 50th anniversary of the World Future Society celebrated next July in Washington DC.

Book Review

by Charles Brass – Chair, futures foundation

The Collapse of Western Civilization: A View from the Future

by Naomi Oreskes and Erik M. Conway

The futures foundation library contains a number of books exploring the rise and fall of civilizations*. Most of these are lengthy, scholarly tomes written first from a historical perspective which is then projected into the present and the future.

This small (fewer than 60 pages, but including an extensive interview with the authors) volume is written in 2393 on the three hundredth anniversary of the “great collapse of Western Civilization”.

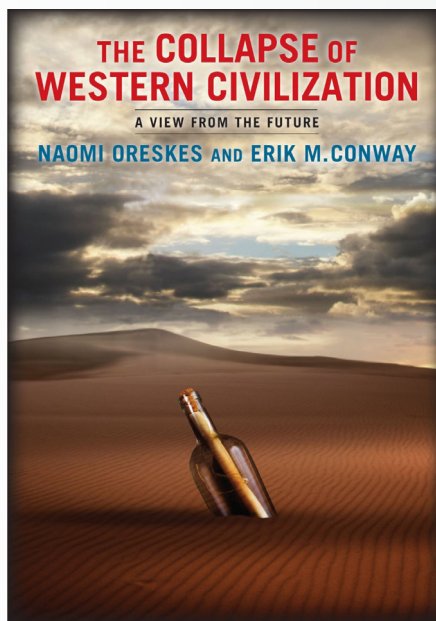
The authors (writing in 2014) are professional historians who passionately believe that what they call the ‘carbon consumption complex’ and the global warming it creates have the potential to bring about the end of Western civilization.

Their narrator (writing in 2393) is Chinese living in the Second People’s Republic of China and recounts the history of Western Culture from 1540 to 2093.

The main theme of the narrative is that human beings (or at least those in positions of power) ignored, denied or lied about evidence of global warming which ultimately destroyed a civilization.

Beginning with the (real) “Sea Level Rise Denial Bill” passed by the government in the US state of North Carolina in 2012 through the (as yet fictitious) “US National Stability Act” of 2025 to widespread political indifference to the Kyoto Protocol, the narrator documents the evidence which was available to legislators in the late 20th century and attempts to understand why it was ignored.

The concept of ‘statistical significance’ gets particularly close attention, with the narrator concluding that: “Western scientists built an intellectual culture based on the premise that it was worse to fool oneself into



believing in something that did not exist than not to believe in something that did” (p18).

The particular details of what (belatedly) caused humans to act are not important for this review (though they seem plausible); but finally by 2050 the world was shocked into action.

The first global intervention was to inject very small sulphate particles into the atmosphere to increase its reflectivity. However, unintended side effects caused the project to be abandoned ten years later, and the rebound temperature increase made things even worse.

About 30 pages of the book are devoted to exploring what ultimately caused the deaths of 60-70% of the human population. Ultimately global temperature increase caused the breakup of the West Antarctica ice shelf which in turn caused an eight metre rise in sea levels, displacing nearly two billion people and the spread of a

new ‘black death’ bacterium which killed many of those who didn’t either drown or starve.

The final 20 pages attempt to understand why ‘the market’ which was the backbone of Western Civilization collapsed. It concludes: “Given the events recounted here, it is hard to imagine why anyone in the twentieth century would have argued against government protection of the natural environment on which human life depends. Yet such arguments were not just made, they dominated the public sphere. The ultimate paradox was that neo liberalism, meant to ensure individual freedom above all, led eventually to a situation that necessitated large-scale government intervention”(p48).

The epilogue examines why more Chinese survived than any other nation. “When sea level began to threaten coastal areas, China rapidly built new inland cities and villages and relocated more than 250 million people to higher safer ground”(p51). A somewhat ironic conclusion for those who currently argue we need less not more government intervention.

Writing from the perspective of a future historian is a common futurist technique and in this little book Oreskes and Conway demonstrate just how useful and insightful it can be.

* For example: *Collapse: How Societies Choose to Fail or Survive*
by Jared Diamond
Penguin, 2005

The Collapse of Complex Societies
by Joseph A Tainter
Cambridge University Press, 1988

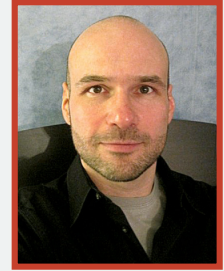
The Collapse of Globalism and the Reinvention of the World
by John Ralston Saul
Penguin, 2005

Living in the End Times
by Slavoj Zizek
Verso, 2011

SIGNALS IN THE NOISE

9 Bizarre Jobs That Will Redefine Our Lives In The 2050s

by George Dvorsky
The Institute for Ethics and Emerging Technologies



1. Personal Microbiome Steward

We have only just begun to comprehend the complexity of the relationship between human beings and the trillions of microscopic organisms that live on and inside us. But what scientists have learned so far suggests that our bodies' micro-organismal communities play a role in everything from body weight, to energy levels, to mental health.

The first ever full body scans of chemicals on the surface of human skin are revealing that many are residues from topical skin products, raising concerns that man-made chemicals are disrupting function of the skin microbiome. It's easy to imagine a future where professional microbiome stewards assist us in becoming conscientious "shepherds" of our own microbiota, through feeding, culling, and rebalancing.

2. Trait Selection Advisor

Last week, scientists in China reported they had edited the genes of human embryos. The researchers had attempted to tinker with the gene behind β -thalassaemia, a dangerous blood disorder, with a technique called CRISPR/Cas9. The study marks the first documented attempt at human germline editing, and has revived the debate over the ethics of human augmentation and designer babies.

Germline modification could one day be used to not only mend genetic sequences, but insert new ones in pursuit of desirable traits. In the long term, we'll have to think practically about how to regulate the market for made-to-order humans and advise parents looking to have genetically engineered children. A personal trait selection advisor could help parents understand the legal limits of germline editing while working with them to define what genetic edits might be best for their future offspring.

3. Mind-Uploading Re-integration Specialist

Mind uploading sounds like pure science fiction. It's hard enough to digitize analog books without creating unwanted errors, so what hope is there for digitizing human selves?

While mind uploading is certainly mind-bogglingly complex, some scientists believe it's possible. The thinking goes like this: If our selves are encoded in the structure and activity patterns of our brains, then as long as we can capture and catalog the nanostructure of a human brain (see: #9 Connectome Architect) we can re-instantiate those same structure and activity patterns in another suitable medium that is equal or superior to brainmeat. Like, say, a mainframe computer.

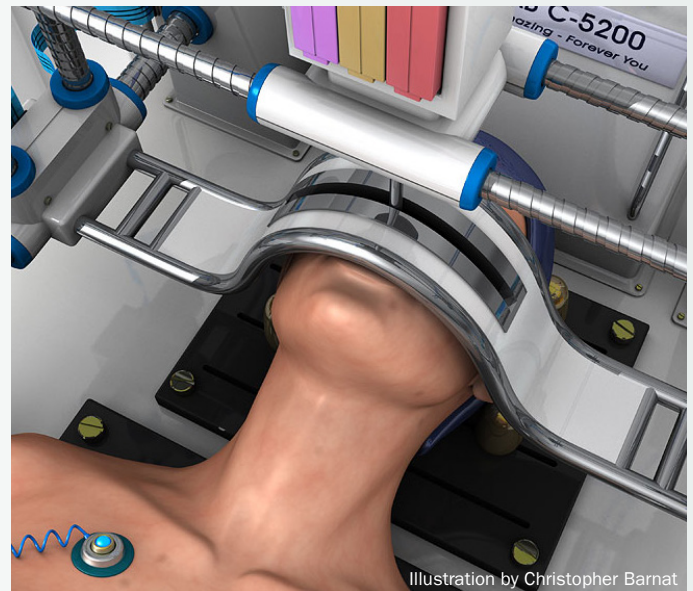


Illustration by Christopher Barnat

Mind uploading has been put forward as a possible future state for entire human civilizations. But it could also be an effective way to "warehouse" human selves whose bodies were ravaged by disease, while new bodies are being prepared for them.

Who knows what effect the round trip from meat to silicon to meat would have on a human mind—especially if the person re-emerged into a radically changed world? A new class of re-integration specialist could instruct new arrivals from the digital otherworld in everything from physical therapy to new cultural norms. These new arrivals could even be suspended in a phygital zone — a sort of "halfway house" incorporating elements of digital and physical substates — so that they could acclimate themselves to life among living, breathing, excreting bodies gradually and gently.

SIGNALS IN THE NOISE

9 Bizarre Jobs That Will Redefine Our Lives In The 2050s

4. Organ Farmer

Organ shortages are already a huge problem today. Each year in the U.S. there are about 28,000 transplants while another 120,000 people are assigned to waiting lists. It has been estimated that some 35% of all annual U.S. deaths could be prevented by organ transplantation. Hence the impetus to develop lab-grown organs.

As regenerative medicine continues to advance, so too will our capacity to produce organs affordably and *en masse*. San Diego-based Organovo is a leader in this area through its development of a 3D bio-printer. Its lab can generate mini-liver assays that are virtually identical, architecturally and biologically, to human livers. Another approach is to create a 3D scaffold of an organ, such as a heart, liver, kidney, or lung, and use a patient's stem cells to grow an entirely new organ for transplantation. Looking to the future, and given the intense demands for organs, the job of an organ farmer could become an appealing one, indeed.

5. Synthetic Protein Designer



Photo by David Parry

Global demand for meat, fish and other sources of protein is increasing, as countries like China grow in size and economic influence. According to the UN, worldwide meat consumption *per capita* doubled between 1961 and 2007, and is projected to double again by 2050. Global meat demand, coupled with shortages in resources like water and arable land, is sparking innovation within the food science space. If, by 2025, meat is less available, affordable or palatable, what proteins will consumers be able to access?

Today, startups like Modern Meadow and Beyond Meat are developing alternatives to farm-raised meat through *in vitro* and meat-substitution technologies. If the industry takes off, the demand for palatable synthetic proteins—and the people who design them—stands to flourish, as well.

6. De-extinction Zoologist

Scientists around the world are making headway on bringing extinct species back to life, and while there are many valid questions and concerns over the ethics of de-extinction, the process holds promise for restoring and conserving threatened environments.

For instance, many varieties of elephant once roamed the earth and played an important part in the health of the planet's ecosystems. A renewed elephant (or mammoth!) population in the US could trample dry earth in the vast desertified swaths of the American midwest, aiding human reforestation efforts. One of the biggest unknowns surrounding de-extinction is how previously extinct animals would fare in ecosystems that had, in a very real sense, left them behind. A de-extinction zoologist could help manage a species' reintegration to the wild, and assess any unintended ecological impacts of the species' introduction to the habitat.

7. Biomechanics Service Person (or Med-chanic)

With a growing amount of technology being integrated onto and into our bodies, it's not hard to envision the rise of informal specialists who can repair, upgrade, and maintain specific cybernetic add-ons.

These "med-chanics" might work out of private shops, and visiting one of these shops might be like taking a car in for a tune-up. Imagine having your body-worn or embedded devices configured, repaired, or overhauled by the equivalent of a vehicle mechanic for the body. The position may lack the the emotional and psychological aspects of more traditional healthcare, but its efficiency and simplicity will be a welcome element in the future care of our cyborg selves

SIGNALS IN THE NOISE

9 Bizarre Jobs That Will Redefine Our Lives In The 2050s

8. Pharma Artisan

One possible outcome of the push for personalized medicine, low cost gene sequencing, and rapid drug prototyping is a future where small batches of highly customized drugs are designed quickly and synthesized on-demand. “Pharma artisans” might craft small-batch drugs based on a comprehensive understanding of an individual’s genetic make-up, personal health history, socio-economic environment, personal habits and daily routines, and so on.

Today, cooking drugs in a private lab conjures images of outlaws and misfits working in dark and grey markets. Tomorrow, independent drug producers could occupy a more legitimate (and more therapeutic) place in the healthcare ecosystem.

9. Connectome Architect

The human brain contains around 115,000 neurons per cubic millimeter, with each individual neuron making up to a thousand connections to the neurons around it. The complexity in a barely visible cube of brain tissue is astonishing. Now consider that the average adult brain contains around *1.3 million* such cubes.

That’s — to put it lightly — a lot of wiring. The task of creating a diagram that specifies these inputs and outputs — called the “human connectome” — is arguably the most complex technical project humans have ever embarked upon.

But this project is probably worth the overhead. A complete human connectome could drastically improve our understanding of the circuit-level origins of brain diseases and mental illnesses. It could also help future health professionals create targeted, nano-surgical interventions on the human brain. Think about the connectome as the schematics of a building. If the building requires work on its foundations, the blueprint can help us understand what parts of the building require buttressing. In like fashion, the connectome could provide a guide for planning surgeries that reroute neuronal processes to eliminate unwanted mental characteristics (or enable desirable ones).

The original article can be found here:

io9.com/9-weird-jobs-in-biotech-and-medicine-to-look-for-in-the-1701486512

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