

Notes from the Edge

Insights into an Evolving Future



VOL 6 – ISSUE 1

JANUARY 2016

A Product of the *Futures Assessment Division*

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REPORT CARD

The Long Boom: A History of the Future, 1980-2020. *WIRED* magazine recently finished publishing its entire catalog (including previously print-only-available issues) to the internet. Of particular interest was the below article, written by futurist Peter Schwartz and Peter Leyden, and published in 1997. Of note are the things they got right (for example: reliable, immediate voice translation in 2015), and, of course, what they got immediately wrong (gov't bureaucracies flatten, and economic prosperity for all).

[WIRED's Long View](#)

Predict the Future if You Dare. Beware the day when newspaper editors get sick of yesterday's news and start predicting the future. The results are often entertaining, though never intentionally so, especially when read with the benefit of hindsight. For the careful reader, the prophecies also can be a crystal ball into the past, the daily worries and dreams of the long-ago experts. Back in 1908, former Tribune education editor David Swing Ricker cast his imagination 66 years into the future and saw a Chicago of 10 million souls. An accompanying map showed the city of 1974 had gobbled up Evanston and Winnetka to the north, Riverside and Western Springs to the west and Mokena to the southwest.

[Chicago's Urban Sprawl](#)

Unclouded vision. The Chinese had the I-Ching; the Romans peered at the entrails of sacrificed animals. These days, anyone wanting to know what the future holds can consult everything from telephone psychics to intelligence agencies, bookies, futures markets and media pundits. Their record is far from perfect. But it is difficult to say just how imperfect: for all the importance people attach to forecasting, hardly anyone bothers to keep score. In this article the *Economist* takes a look at co-authors Philip Tetlock and Dan Gardner book *Superforecasting*. What the co-authors show is that the future can indeed be foreseen, at least in the near term. More interestingly, they show that some people are much better at it than others. And, crucially, the co-authors show that prophecy is not a divine gift, but a skill that can be practiced and improved. [Superforecasting](#)

FORECASTS

How Soon Before Your Job Is Done By A Robot? This Handy Chart Will Tell You. If you're planning a career, or planning a career change, it may be worth thinking about how automation could affect the job market of the future. We know that advances in artificial intelligence and robots could have massive implications for the labor market, reconfiguring some jobs and eradicating others. If you're looking for a *safeish* sort of work over the next decade or two, it's probably a good idea to be on the right side of the wave.

[That's Robot Work](#)

TECHNOLOGY

Oxygen absorbing material may allow us to breathe underwater. Using specially synthesized crystalline materials, scientists from the University of Southern Denmark have created a substance that is able to absorb and store oxygen in such high concentrations that just one bucketful is enough to remove all of the oxygen in a room. The substance is also able to release the stored oxygen in a controlled manner when it is needed, so just a few grains could replace the need for divers to carry bulky scuba tanks. (What might the military applications be?)

[Aqualungs](#)

University of Edinburgh Makes Precursor to Metallic Hydrogen. British researchers think they have come close to creating a long-sought new state for hydrogen. They have put a sample of the familiar gas under so much pressure that it takes on a previously unseen solid crystalline form. The team tells the journal *Nature* that this phase may be just a step away from so-called metallic hydrogen. Predicted 80 years ago, this exotic substance could lead to ultra-fast computers and even super rocket fuel.

[Metallic Hydrogen](#)

Chinese Scientists Unveil New Stealth Material Breakthrough. A group of scientists from China may have created a stealth material that could make future fighter jets very difficult to detect by some of today's most cutting-edge anti-stealth radar. The researchers developed a new material they say can defeat microwave radar at ultrahigh frequencies, or UHF. Such material is usually too thick to be applied to aircraft like fighter jets, but this new material is thin enough for military aircraft, ships, and other equipment.

[UHF Stealth](#)

CONSEQUENCE MANAGEMENT

Gene Drives. Most powerful new technologies are double-edged. Cars are a vast improvement on horses as a means of transportation, but they also kill more than three thousand people a day and they are a major source of pollution. So here comes another double-edged technology, and its edges are very sharp. Gene drives can spread an engineered mutation through an entire species with amazing speed, which means that you could, for example, make the breeds of mosquitoes that transmit the malaria parasite to human being immune to the parasite themselves.

[Double-Edged Sword](#)

A Crispr Future. Genetic engineering has improved over the decades, but for years the process was expensive, time consuming, and inexact. Crispr-Cas9, described as a "game changer," this new technology has offered precision genomic-editing capabilities that are cheap, easy, and fast. But like any new technology, this one has also raised ethical and security concerns. What does it mean for human society or the planet in general, to introduce potentially permanent changes to *Homo sapiens* or another population? At a recent meeting in Washington, an international gathering of scientists went so far as to call for a halt in the use of Crispr-Cas9 on the human genome until more was known about potential risks. Chinese scientists have already used the new technology to edit the genomes of human embryos, raising the specter of genetically altered humans and the genetically altered progeny they'd produce. Advances in science are moving fast, and a future of genetically altered organisms, including humans, is becoming a very real possibility. [Science Fiction or Science Fact](#)

Researchers Teaching Robots How to Best Reject Orders from Humans. Gordon Briggs and Matthias Scheutz, from Tufts University's Human-Robot Interaction Lab, are trying to figure out how to develop mechanisms for robots to reject orders that it receives from humans, as long as the robots have a good enough excuse for doing so. The overall goal here is not just to teach robots when they should (and should not) follow orders, but also to provide a framework within which the robot is able to effectively communicate why it rejected an order.

Rejecting Orders

Virtual Reality and a Parallel Universe of Cyberclones. One of the biggest technology trends of 2015 was virtual reality (VR), from Oculus Rift to Google's cardboard headsets. It is exciting to predict which killer app incorporating these technologies might become the next unicorn in 2016. But perhaps it is equally worthwhile to pause for a moment and ponder the implication of these technologies in the physical world, both in the near and distant future. It's not hard to imagine a future where all data is consolidated into a very legit digital imprint of yourself: a "cyberclone." Where it gets creepy is your cyberclone could live in the virtual world despite your death in the real world. A cyber spirit? Would it compensate for your absence in the physical world?

Cyberclone Lives On

ECONOMICS

Does Bitcoin's underlying technology have other uses? Investors think so.

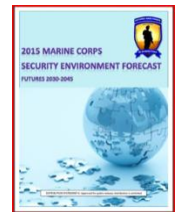
Anyone interested in modern technology has heard of the digital currency called Bitcoin, even if few people understand how it works. As Bitcoin and other digital currencies evolve, the technology that underlies them may soon spread into other transactions: trading stock, buying and selling real estate, purchasing music and much more. A mini-industry is forming to take advantage of the technology called blockchain, aiming to make a wide variety of transactions faster, cheaper and more secure. The idea is to remove, as much as is practical, people and their bureaucracies from the transference of money, contracts and other data where tracking ownership is important.

Future of Blockchain

MARINE CORPS SECURITY ENVIRONMENT FORECAST

The 2015 *Marine Corps Security Environment Forecast: Futures 2030-2045* as announced in [MARADMIN 387/15](#) is open for public release and is available for download at the FAD website:

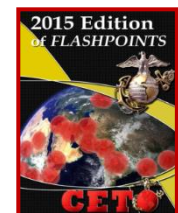
Futures Assessment Division



FLASHPOINTS 2015

The 2015 edition of Flashpoints provides the results of our most recent analysis of factors associated with a nation's risk for conflict. It provides an updated ranking for the 159 nations included in the study based on each nation's potential to experience future conflict or instability. This is the tenth annual edition.

CETO - Flashpoints 2015



This newsletter is intended to highlight issues and ideas which may prove significant in the evolving future. In keeping with our focus on both alternative futures and analysis, items in this bulletin will generally be of an alternative nature, or drawn from atypical sources.