Notes from the Edge

Insights into an Evolving Future
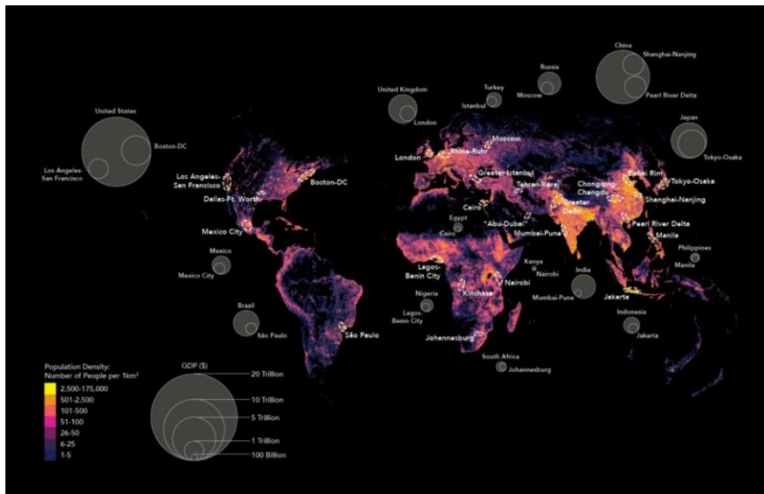
TABLE OF CONTENTS

HUMANITY'S FUTURE

Humanity's Future – Fragile or Hyperconnected, or Both? Parga Khanna, author of Connectography, portrays a future global network in which mega-cities compete over connectivity more than borders. Mega-cities will battle over pipelines, internet cables, advanced technologies, and market access, while technological discoveries and innovations eradicate resource wars. In his Op-Ed, Khanna argues that the U.S. is already drifting towards looser metropolitan and regional formations, anchored by great cities and urban archipelagos that are leading global economic circuits. Perhaps the future U.S. map will depict seven mega-regions with a few vital Urban Corridors and will be less focused on bordered states.

Future Connectivity   Six Maps That Will Make You Rethink the World
Connectography: Mapping the Future of Global Civilization   A New Map for America

It's Not All Genes: Getting Evolution Right When Explaining Human Behavior. Biological anthropologist Agustin Fuentes suggests that anthropologists can do a better job of understanding humans by bringing together two divergent perspectives: evolutionary science, aimed at understanding biological contributions to human behavior, and field ethnography, a process of studying human behavior in the natural setting (cultural system) in which people live. Fuentes is weary of a heavy focus on genes and natural selection in the evolutionary modeling of human behavior because this view of human phenomena (e.g. mating behavior, or human aggression) misses the richness of being human. For example, take Monoamine Oxidase A (MAOA), also called the "the warrior gene". One version of this gene is associated with hyper aggression in males (it is little studied in females); however, expression of this gene is related to childhood stressors and life experience. A slightly larger percentage of men with the "aggressive" version of this gene (compared to those without it), who live through real childhood trauma and social stress are highly violent and have trouble controlling their behavior as adults.

It's Not All in the Genes   Ethnography and the Human Niche

In the Future We'll All Be Identified by Our 'Brainprints'.
A team of psychology and computer engineering professors at Binghamton University was able to successfully match test subjects to their uniquely identifying brain waves—or, brainprints—with 100 percent accuracy. In a study titled "CEREBRE: A Novel Method for Very High Accuracy Event-Related Potential Biometric Identification," researchers set out to test the reliability of biometric identifiers. Each subject was fitted with an EEG headset called an "electroencephalogram" that measures the electrical activity in a person's brain through electrodes attached to their scalp. Subjects were then shown a series of 500 images that were specifically chosen to elicit neural responses, such as "a slice of pizza, a boat, Anne Hathaway, the word 'conundrum.'" The study's authors discovered that each person's brain wave responses to visual stimuli were unique enough to identify them - very much like fingerprints or DNA. Brain biometrics present new opportunities for more soundproof methods of identification.
Brainprints

MIGRATION

Go South Young Man: Migration in the Developing World. While the West is fixated with migration to Europe from the developing world, it's just as common for people looking for fresh opportunities and a better life to journey South. The distances may be shorter - most travel is between regional neighbors – but navigating official restrictions can be just as hard. Migration in Africa is overwhelmingly about jobs. "It appears to have many economic benefits for the destination countries as well (and for migrants themselves and origin countries)," notes a Regional Mixed Migration Secretariat report exploring mixed migration and the development debate. Destination countries have traditionally been in Europe and the Gulf states, but there is an under-researched southern route, from Kenya down to South Africa – the continent's second largest economy.
African Migration   **RMMR Report**

MACHINE LEARNING

Future Co-Working: A Space Where Humans and Robots Will Learn from Each Other? Engineers at Technical University Dresden think humans still have another 10 or 20 years before becoming irrelevant. In the meantime, humans can train robots via wearable technology. Although no one can predict the future, Joseph Sirosh, corporate VP of the Data Group at Microsoft, outlines five trends to watch in the world of algorithms, the cloud, internet of things, and big data.
How to Train a Robot   **The Future of ACID: Algorithms, Cloud, Internet of Things, and Data**

TECHNOLOGY

After Moore's Law: Predicting the Future Beyond Silicon Chips. The principle guiding much of the innovation in computing has been Moore's law — a prediction, made by Intel co-founder Gordon Moore, that the number of transistors on a microprocessor chip would double every two years or so. What it's come to represent is an expectation, as The New York Times puts it, that "engineers would always find a way to make the components on computer chips smaller, faster and cheaper." The first article linked below details an effort by the Institute of Electrical and Electronics Engineers called the International Roadmap for Devices and Systems. Some of the ideas scientist are considering, including biologically inspired ways to compute, machine learning, and quantum computing. The second article begins where the first leaves off. As information technology fades into the background, second order technologies, such as genomics, nanotechnology, and robotics will take center stage. This article shares the four major paradigm shifts that we need to watch and prepare for: Moving from the Chip to the System, from Applications to Architectures, from Products to Platforms, and from Bits to Atoms. [The Forbes website may be a little difficult to get to. Be patient, it's a good read]
Is Moore's Law Dying?   Four Paradigm Shifts For Future Technology

There's More Than GPS: A New Type Of Locating. A Californian company, 5D Robotics, proposes we mark locations with transmitters broadcasting in ultra-wide-band (UWB) frequencies. UWB signals are low power, which makes for short range – about 200m – but if you have enough beacons, that shouldn't be a problem, says Philip Mann, 5D VP for sales. "The beacons measure the distance between themselves by simple ranging; then a vehicle can navigate by triangulation." The company is testing the waters carefully. They've adapted their system for use with some of the slowest vehicles around: wheelchairs. 5D is developing, in cooperation with San Francisco startup Whill, a new type of wheelchair: the Model A.
Beyond GPS

The 15 Most Disruptive Technologies of 2025. The Internet and smartphone are just the latest in a 250-year-long cycle of disruption that has continuously changed the way we live, the way we work, and the way we interact. The coming Augmented Age, however, promises a level of disruption, behavioral shifts, and changes that are unparalleled. While consumers today are camping outside of an Apple store waiting to be one of the first to score a new Apple Watch or iPhone, the next generation of wearables will be able to predict if we're likely to have a heart attack and recommend a course of action. Notes From The Edge readers will recognize most of these technologies from previous months' editions, but we thought this was a worthwhile collection.
15 Most Disruptive Technologies of 2025

FUTUROLOGY

Afraid of the Future? Try Technotopia.
John Biggs wants to disprove the dystopian future of humanity. In his weekly podcast, he speaks to futurists about the environment, bitcoin, and a better future.
**Technotopia**
10 Books That Will Change The Way You Think About the Future
Meet Sweden's Secretary of the Future

MARINE CORPS SECURITY ENVIRONMENT FORECAST

The *2015 Marine Corps Security Environment Forecast: Futures 2030-2045* is available for download at the FAD website. This summer, FAD will publish a supplement to the MCSEF. We look forward to bringing that to you.
Futures Assessment Division
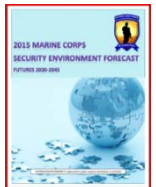
ART OF WARFARE PROJECT

The Atlantic Council's Art of Warfare Project seeks to cultivate a community of interest in works and ideas arising from the intersection of creativity and expectations about how emerging antagonists, disruptive technologies, and novel warfighting concepts may animate tomorrow's conflicts. The Project partnered with the FAD to host a Science Fiction Futures Workshop in which published authors Max Brooks, Charles E. Gannon, and August Cole worked with 18 talented science fiction writers from across the services, with the goal of bringing the 2015 MCSEF future worlds to life.
Art of Warfare

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.