TYPE 3 SCENARIO

Supersedes our current understanding of reality

THE WORLD ELECTRIC

THE CASIMIR EFFECT KICKS OFF AN ENERGY REVOLUTION. This phenomenon—observed in experimental physics where energy is produced from manipulating the subatomic void between two objects—is harnessed to produce cheap energy, using a device the size of a car battery. Converters to wireless energy, commercialized by 2015, find their natural match with new zero-point energy boxes, making abundant energy not only portable but also transferable to all kinds of devices. The shorthand name for the two, *Tesla boxes*, catches on. A university lab in Malaysia is among the first to put the pieces together, producing a sustained energy-generating effect with materials found in most well-equipped university physics and engineering departments. Schematics for the Tesla boxes disseminate through open-source channels, even where the technology is suppressed. With tinkering to validate, improve, and ensure safety, the new technology advances globally, but most rapidly in developing regions such as South Asia, Southeast Asia, and Latin America. While some communities readily adopt small-scale Tesla boxes, there is a great deal of anxiety about the disruption of the energy market around the world. Countries exporting materials used in increasingly antiquated types of batteries are especially nervous, and some suspect that they are behind attacks on university campuses involved in disseminating the technology.

- Tata is one of the first companies to jump on board and add value to the basic technologies, seeing the potential for making electric vehicles viable at a large scale. They also begin to manufacture kits for converting basic fixtures and appliances, opening the door for people and neighborhoods to quickly tap into the new power source. Slums across India and Southeast Asia are illuminated.
- Singapore latches on to the discovery as a major enabler of national infrastructure and self-sufficiency—pioneering distribution and conversion of legacy infrastructure on a national scale.
- U.S. car manufacturers scramble to follow Tata's lead, but politicians fear everything from potential loss of energy jobs to ill-health effects from wireless power.
- Although some cities attempt to convert neighborhoods, pointing to the increasing number of fires from overloaded and poorly maintained electrical systems as justification, most efforts are mired in lawsuits.
- Telecoms make a move on the energy industry by expanding cell towers and linking them to the new devices. Successful efforts to piggyback information on wireless energy signals lead to rapid commercialization of the technology. But saboteurs also use it to transfer malware along with electricity.
- As most commercial and personal vehicles and devices are converted to run on this new electrical source, fossil fuels are redirected primarily to jet and cargo fuel.

TYPE 3 SCENARIO

Supersedes our current understanding of reality

THE WORLD ELECTRIC

- **A scientific breakthrough** eliminates energy scarcity.
- **Casimir effect** is harnessed to produce usable energy.
- **Wireless electricity** is useful at large scales.

LINKS TO FORECASTS:

DEINDUSTRIALIZATION accelerates as lightweight, distributed energy creates a new paradigm for powering production of goods and services.

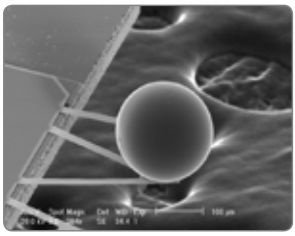
DEMATERIALIZATION leverages the growing knowledge of very small-scale physics to embed energy in objects created through atomically precise manufacturing.

SOCIAL PRODUCTION is further enabled by the availability of an effectively infinite "battery," eliminating a key roadblock for technological innovation.

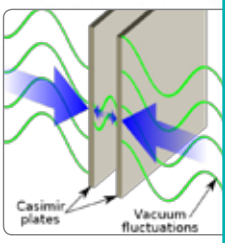
SIGNALS

The Casimir effect demonstrates energy creation

First postulated in 1948 (and observed experimentally since 1998), the Casimir effect describes how quantum fluctuation can cause particles to pop into existence in a vacuum, creating energy and pressure. This photograph shows how a 0.1 mm ball moves toward a smooth plate in response to energy fluctuations in a vacuum, considered evidence of the form of energy known as dark energy.



apod.nasa.gov



en.wikipedia.org

Witricity aiming for wireless power by 2013

A company founded in 2007 with the help of MIT researcher Marin Soljačić, aims to have fully commercialized room-scale wireless power by 2013. The company offers a kit of patented modules that can be configured to provide wireless charging and battery-free direct powering of devices.

witricity.com

Intel demonstrates broadcast energy technology

Intel has demonstrated a wireless broadcast electricity technology, with a stable transmission range of 70 cm and 75% efficiency (that is, 25% of the power is lost in transmission). It can power a light bulb or small notebook computer.

intel.com

TYPE 3 SCENARIO

Supersedes our current understanding of reality

LOOK FOR THE ROBOT LABEL

THE USE OF ROBOTS AND OTHER SEMI-AUTONOMOUS DIGITAL SYSTEMS SPREADS RAPIDLY AS COSTS DROP AND CAPABILITIES INCREASE.

The fastest wave of labor replacement happens at the mass-production level, with robots taking a rising percentage of manufacturing jobs. But a surprising amount of "bot-sourcing" happens at higher-skilled levels, assisting and then replacing not only construction workers and truck drivers but also surgeons, lawyers, accountants, and other knowledge workers. With computerized work systems offering 24-hour labor with no time off needed for illness or vacation, companies gravitate toward the use of robots. The burst of robot labor replacement has differential effects around the world. Developing nations that rely on cheap human labor are more or less untouched, although the already minimal wages for employees suffer. China backtracks on the use of robots as the lack of good work opportunities leads to growing political unrest. Europe, with its dwindling population, embraces robot labor wholeheartedly, with Scandinavia leading the way, noting that the use of robots supports a basic income guarantee for humans. In America, with the safety net stretched to near-breaking, a compromise is reached to tax robot use at levels that are less than what an equivalent human worker would be paid, but still enough to support extended social services.

- Among the jobs not readily replaceable by robots are high-touch service professions in health care, beauty, and education—jobs that are traditionally performed by women.
- As nursing jobs become more lucrative than careers as surgeons, some argue that high-touch or "pink-collar" jobs should be valued more highly, while others argue that more men should be doing those jobs.
- Psychological depression grows as people struggle to redefine themselves without work as a key identity marker.
- The rise of guaranteed income for citizens in Europe leads to more aggressive immigration and border controls and the expulsion of non-European immigrants in some countries.
- Activists opposed to the use of robot labor, as well as ethicists concerned about its cultural and emotional impacts on society, refer pointedly to the social support robot tax as the "Three-Fifths Compromise," using the slavery parallel to push against the continued spread of robot labor.

TYPE 3 SCENARIO

Supersedes our current understanding of reality

LOOK FOR THE ROBOT LABEL

- **Workers displaced by machines** are not reemployed in other sectors.
- **Permanent large-scale unemployment** is an acceptable state in an advanced economy.
- **Machines can outperform humans** at most kinds of knowledge work.
- **Robots are not solely property,** but semi-sentient beings with some personhood rights.

LINKS TO FORECASTS:

DEMATERIALIZATION accelerates as distributed robotic labor changes the nature of work, manufacturing, and the economic landscape.

SOCIAL PRODUCTION provides new models of productivity that distinguish between occupation (a regular activity that engages one's focus) and work (an activity that generates income).

INFORMATION INTENSIFICATION drives the ability of computerized systems to undertake complex, nuanced work—especially knowledge work.

BIOMOLECULARIZATION focuses on discovering ways to increase empathy, reduce stress, and support happiness in a period of extreme global economic disruption.

SIGNALS

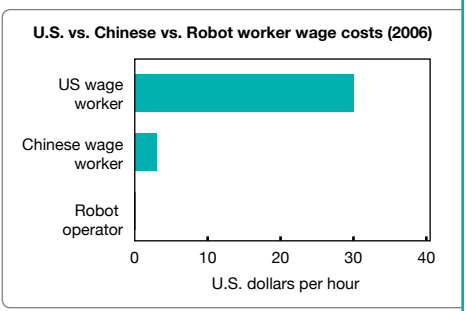
Factory workers replaced by robot workers

Taiwanese electronics manufacturer Foxconn announced in 2011 that it will be replacing much of its 1.3 million human workforce with robot workers. Employee suicides, labor complaints, and rising wages have all made human labor less attractive.

guardian.co.uk

Economics drive adoption of robot operators

In 2011, the chairman of the Robotic Industries Association estimated that a robot operator costs 1/200 as much as a skilled UAW welder and 1/10 as much as a comparable Chinese worker. Over 15 years, a $250,000 investment in a robotics system replacing two workers for two shifts per day, five days a week, would return a savings of $3,537,267.



IFTF based on data from *Forbes*, reported in Dean Elkins, "Let the Sparks Fly," 2011

Companies outsource "steel-collar" workers

In a sign of the economic opportunities provided by the growth of robotics, Michigan-based Steel Collar Associates supplies Motoman industrial robots to industry as contracted hourly employees. The company claims that all "the advantages associated with hiring white-collar and blue-collar associates on contract apply to hiring steel-collar associates on contract."

scarobots.com

TYPE 3 SCENARIO

Supersedes our current understanding of reality

B.I.G. ENDS POVERTY

POVERTY IS HISTORY—BY LAW. The Basic Income Guarantee (BIG) distributes a livable minimum income to every human being on the planet. Sufficient to guarantee access to food, clean water, and shelter, BIG is administered at the national level through biometric ID systems subsidized by the World Bank and distributed equally, regardless of income. It is enforced by a global treaty and funded through a global Financial Transaction Tax, also known as the "Robin Hood Tax." Provision of certain public goods is required by treaty in order for countries to receive their portion of the global funding allocation: all citizens must have access to free public health and education services at a minimum global standard that is reviewed annually. Starting as local initiatives in such diverse states as Namibia, Brazil, and Alaska, BIG and the Robin Hood Tax have spread globally, largely as a response to persistent economic volatility and worldwide protests against financial institutions. The 0.05% tax is levied on all financial transactions and is in force globally, creating a trillion-dollar fund. It is widely credited with not only putting an end to extreme poverty, but also stabilizing global financial markets by creating a slight but significant disincentive for the type of microsecond transactions that many claim contribute to volatility and collapse.

- Massive new markets emerge in rural areas of the world's poorest countries, as BIG does not differentiate between urban and rural citizens in its allocations. Meanwhile, investors create entirely new cities to cater to BIG recipients and their limited budgets.
- Major corporations such as PayPal, Google, and Amazon.com compete for government contracts to manage domestic distribution of BIG payments. They offer their own benefits packages, including supplemental BIG payments, enhanced biometric ID systems, and mobile banking solutions tailored to illiterate populations.
- Social shopping sites such as Peixe Urbano, Groupon, and Living Social thrive at the onset of BIG deployments, introducing deals that appeal to people making the first electronic financial transactions of their lives.
- Entrepreneurship increases as people are more willing to take risks in commerce, arts, scholarship, and personal development when their family's basic welfare is not at risk.
- Large banks find loopholes in the Robin Hood Tax, constructing tax-free derivatives markets in the Cayman Islands and Mauritius that mirror public exchanges, but without the transaction costs. Trillions of dollars change hands in virtual stock exchanges, which are particularly powerful tools for hedge funds operating in both real and shadow markets.
- BIG payments are made independent of individual income, as "means testing" has proved a costly barrier to early implementations. Progressive tax code alterations compensate for grants to wealthy individuals, allowing BIG disbursement to be made more efficiently.

TYPE 3 SCENARIO

Supersedes our current understanding of reality

B.I.G. ENDS POVERTY

- **Money is not the best incentive** for productive participation in society.
- **Global protocols** can be administered effectively at the local level.
- **Financial regulation** can actually stimulate innovation by distributing wealth in new ways.
- **The flow from rural to urban** marketplaces is not inevitable.

LINKS TO FORECASTS:

DEINDUSTRIALIZATION disrupts global flows of energy, products, and services, reneging on the promise of an end to poverty through traditional development mechanisms.

DEMATERIALIZATION drives a precipitous decline in traditional mining, manufacturing, and management jobs, creating worldwide unemployment.

SOCIAL PRODUCTION provides multiple platforms for creating value outside traditional wage labor systems—if basic survival needs are met.

SIGNALS

Local experiments with BIG lay the foundation for a worldwide safety net

BIG experiments are underway in communities in Namibia, Mongolia, India, Brazil, and the United States. Funded by NGOs, government agencies, and private philanthropy, these pilot programs are delivering promising results: increased economic activity as well as positive change in health and social welfare indicators. The biggest experiment in this field, which laid the groundwork for many others, is the Alaska Permanent Fund Dividend, which has been making direct payments to Alaskans since 1980, independent of their income.

pfd.state.ak.us

content.usatoday.com

USBIG and BIEN networks gain momentum

The U.S. Basic Income Guarantee Network (USBIG) and Basic Income Earth Network (BIEN—originally Basic Income Europe Network) both hold regular conferences and publish papers on the Basic Income Guarantee. They compare case studies and unite scholars from disciplines across the social sciences. While their coalitions are growing, they continue to appeal more to academic audiences than to public social movements.

basicincome.org

Robin Hood Tax campaign gains support in Europe

The Robin Hood Tax campaign is quickly building support in Europe. With viral video ads featuring British movie stars and with public support from President Sarkozy of France and Chancellor Merkel of Germany, it could become a reality in this time of social unrest and discontent with financial institutions. Billionaires Bill Gates, Warren Buffett, and George Soros, as well as Nobel Prize winners Joseph Stiglitz and Paul Krugman have thrown their financial credibility behind the movement as well. Similar campaigns around the world are taking shape under the banner of the Financial Transaction Tax (FTT), the Tobin Tax, and the French Association for the Taxation of Financial Transactions and Aid to Citizens (ATTAC).

robinhoodtax.org

TYPE 3 SCENARIO

Supersedes our current understanding of reality

THAR BE DRAGONS

THE DO-IT-YOURSELF BIOTECH MOVEMENT UNLEASHES A STAGGERING AMOUNT OF BIOSCIENCE INNOVATION, both academic and commercial. Among the breakthroughs are rapid advances in *novogenesis*, the process of building entirely new species. Much of this research is aimed at the construction of microbes with specific industrial or environmental applications, such as the generation of biofuels or rapid carbon capture. A subset of the work, though, involves the creation of novel multi-cellular organisms, sometimes involving the use of exotic nucleotides not found in nature. Some researchers look at what it would take to bring back recently extinct species, hoping to fight the wave of species loss associated with environmental disruption. Others look at the creation of life based on genetic data from species that died out long ago—dinosaurs, early mammals, and (amid considerable controversy) Neanderthals. A few scientists even start to play with designs for life forms utterly unlike any seen in Earth's history: creatures from myth and legend, with numerous attempts to create dragons. Filmmakers, amusement park operators, and financial service companies underwrite much of this research.

- The more mediagenic efforts—dinosaurs, dragons, and the like—sometimes distract from the more serious projects, but the learning (and funding) arising from the entertainment work supports the environmental projects that might otherwise proceed more slowly.
- Unsuccessful attempts to create pathological microbes (viruses and bacteria aimed at Israelis, in one case) highlight the risks of novogenesis. Many DIY biohackers sign an "Aegis Protocol," vowing to devote full attention to the detection and mitigation of dangerous biohacked species when needed.
- In most cases, novel organisms are the result of very slight modifications of extant genomes. Many of the dinosaurs, for example, are more closely related to chickens than to any species from 200 million years ago.
- The vast majority of projects are unsuccessful, and most of the viable results appear towards the middle of the 2020s. Still, when the first "neo-dinosaur" shows up, the media attention and cultural uproar is overwhelming.
- The Vatican condemns novogenesis research, as do many bioethics and environmentalist organizations. The American Council on Bioethics seeks a moratorium on novogenesis work, but commercial interests manage to hold off any legal bans in the United States and Europe.

TYPE 3 SCENARIO

Supersedes our current understanding of reality

THAR BE DRAGONS

- **Humans can "play God"** and create new life.
- **Mythical creatures from legend** and story can walk among us.
- **Extinction** need not be the end for a species.
- **Human intervention** can restore and revitalize ecosystems.

LINKS TO FORECASTS:

SOCIAL PRODUCTION greatly expands the range of DIY biohacking projects and is the catalyst for bioscience breakthroughs that enable novogenesis.

INFORMATION INTENSIFICATION heightens our human capacity to imagine—and perhaps to manage—a rapidly expanding biomolecular frontier.

BIOMOLECULARIZATION provides the tools for biohacking and bioscience research, with novogenesis as perhaps the most extreme manifestation of biomolecular innovation.

SIGNALS

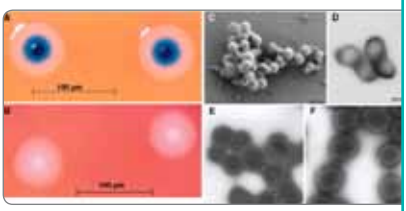
Bioengineering project tackles the "chickenosaurus"

Paleontologist Jack Horner is seeking to "reverse-evolve" a dinosaur, building it on the genetic base of a modern chicken. Regulatory genes, controlling which developmental proteins get built and when, can be artificially modulated to change physiology.

ted.com

Synthetic bacteria can self-replicate

In 2010, the J. Craig Venter Institute created a synthetic genome, copied from a natural genome, and implanted it into an existing cell structure. Named *M. mycoides JCVI-syn 1.0,* the new strain produces bacterial cells that are self-replicating and capable of logarithmic growth. Compared to the control wild-type *M. mycoides,* the synthetic cells appear blue when grown in an x-gal medium because they contain an *lcaZ* gene that converts the x-gal to a blue compound. The ability to "read" and "write" a synthetic genome is a major stepping stone to the creation of new life forms.



jcvi.org

Sequencing of Neanderthal genome provokes debate about recreating one

Professor Svante Pääbo at the Max Planck Institute in Germany is currently sequencing the Neanderthal genome, and has already published a draft version. As a result, anthropologists, ethicists, and biologists are debating whether or not we should attempt to recreate a Neanderthal using cloning technology.

cellnews-blog.blogspot.com

TYPE 3 SCENARIO

Supersedes our current understanding of reality

A HUMAN-TECHNOLOGY PHASE SHIFT

IN A WORLD OF HYPER-DENSE CITIES AND EVEN DENSER INFORMATION STORES, most agree that the singularity is upon us. What they don't agree about is what it is. The singularity foreseen by Victor Venge and Ray Kurzweil—in which human-like sentience becomes embodied in our machines—was predicated on the assumption that exponential technology growth will create a super-intelligence that will supersede human intelligence. However, as argued by Francois Meyer and Jacques Vallée in 1975, technology is actually developing at super-exponential or even hyperbolic rates. In addition, each advance in technology extends the capacity of the environment to support the growth of the human population, also at a hyperbolic rate. Here's the problem: hyperbolic curves reach infinity in a finite time period, which is impossible in the physical world of human beings. Meyer and Vallée showed the linked human and technology curves reaching that infinity point in the mid-2020s. That impossibility has created much speculation about what humanity is actually going through now, in 2022. What is clear is that none of the descriptions of the human condition lend themselves to traditional solutions, whether those solutions involve growth economies or green lifestyles or even widespread war. (The sheer volume of dead bodies would overwhelm the world's ability to dispose of them.) Instead, the transformation appears to be a meta-transformation: a fundamental change in our experience as embodied intelligence.

- Singularity advocates describe the transformation as they have all along: the human curve is collapsing while technology continues to replicate its emergent intelligence in virtual space, where the limits of hyperbolic development presumably don't apply. The memory traces of long-dead humans continue to interact in virtual spaces—amplified, augmented, and distorted by those interactions.

- Some scientists argue that the technology curve is actually slowing and forcing humans into ecological stasis and that die-off is a known phenomenon in species that overuse their environments. They forecast a rebound of a more balanced and wiser species in a thousand years' time.

- Others encounter this shift in human experience as outright collapse of the human species and work feverishly to create new species the size of mice but with human consciousness.

- Still others argue that off-earth solutions are effectively collapsing the human-technology curve by changing the way we count human population—on a limited earth versus across an apparently infinite universe.

- Finally, there are those who would tap the next phase of technology, in which a photo-biological technology replaces the historically dominant chemo-electro-mechanical technology to transform human biology itself into a more efficient substrate of bacteria—allowing human experience and expression to occur in new biological forms and effectively transforming the experience of the human individual.

TYPE 3 SCENARIO

Supersedes our current understanding of reality

A HUMAN-TECHNOLOGY PHASE SHIFT

- **Human life** can be sustained indefinitely off the planet.
- **Human sentience** can be separated from the human body.
- **The environmental burden of humans** can shrink by as much as 90% as humans reembody the 1%–10% of cells that are genetically human.
- **Humans achieve an order-of-magnitude increase** in internal energy efficiency, allowing them to accomplish unimagined feats of physical endurance and/or speed.

LINKS TO FORECASTS:

DEINDUSTRIALIZATION is accelerated by a transformation of human energy requirements.

DEMATERIALIZATION leads to atomically precise humans as well as atomically precise materials and products.

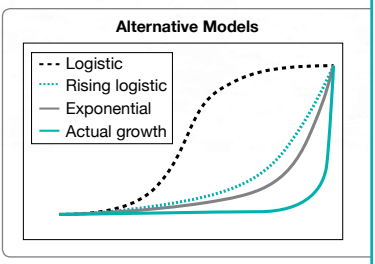
INFORMATION INTENSIFICATION transforms human cognitive capacities, extending them beyond the familiar functions of the brain-body system.

BIOMOLECULARIZATION provides the knowledge and tools to reconfigure the human/bacterial ecosystem.

SIGNALS

Human population growth doesn't conform to typical species growth patterns

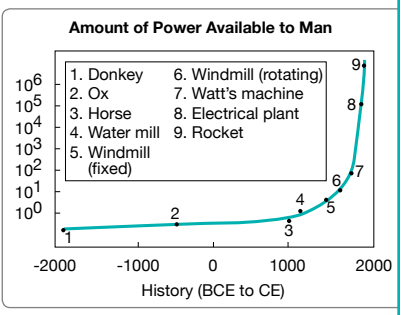
Current thinking holds that natural populations follow a logistic curve in which growth stabilizes at the carrying capacity of the environment. However, according to a 1975 paper by Francois Meyer and Jacques Vallée, human population growth follows a hyperbolic curve. Technological development is often described as exponential, but in the long view, it is also hyperbolic.



jacquesvallee.net

Cascading technological growth curves lead to hyperbolic growth

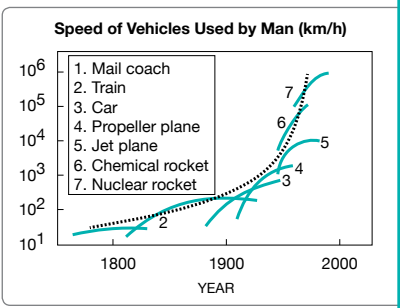
While the evolution of individual technologies—in this case, the speed of vehicles—follows an S-shaped curve, the envelope of technological development follows a hyperbolic curve. This is true across multiple technologies, from power to information processing, and can be described as a relay phenomenon or a self-accelerating system.



jacquesvallee.net

Technological evolution outpaces human evolution

Plotting technology against human skull size, we can see that the growth of technology is initially slower than human biology. But it begins accelerating precisely when the biological curve (dotted line in graph) flattens out. This means that technology has outpaced human genetic evolution to date. In a phase shift, technology could actually alter the speed of human genetic evolution.



jacquesvallee.net