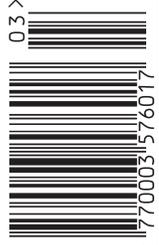


ANTIOCH
the REVIEW

ISSN 0003-5769



The Education of an Artist



Mankind's Greatest Challenge: Artificial Intelligence

BY JAY TUCK

Introduction

We're too stupid to understand.

That's why we will probably not recognize the true threat of Artificial Intelligence until it is too late. An Artificial Intelligence such as IBM's Watson is capable of ingesting and analysing 200 million pages of data in three seconds. Humans, with their 1200 grams and 20 Watts of electrical power, are hardly able to comprehend what 200 million pages are. And Artificial Intelligence is growing with exponential speed. The human brain cannot comprehend exponential growth. Not really. Linear growth, that is x percent per year, we can understand. But values continually multiplied by ever-increasing numbers are quickly beyond our imagination.

Exponential growth is a concept in mathematics. Sissa Ibn Dahir, inventor of the game of chess, wanted to know how much rice would fit onto a chess board if the number of grains was doubled on every square. One grain of rice was placed on the first square, on the second two grains, then four, then eight, up until the sixty-fourth square, continually doubling.

According to this model there would be 9.22×10^{15} grains on the last square. That is more than nine quadrillion grains of rice (9,220,000,000,000,000,000,000) with a total weight 270 million tons, a quantity of rice that would could cover the state of Texas at a depth of one inch.

On the sixty-fifth square the rice would double itself again, on the sixty-sixth square once more. Exponential growth generates quantities

that are hardly understandable for a normal human being. For this reason we did not understand what was happening when the electronics industry began to grow at exponential speed. The consequence of such growth goes far beyond our imagination. Thus we hardly took notice as the global data storage for all humanity grew into the immeasurable. We only understood that it was developing at great speeds.

How great they were, we could not begin to comprehend.

Eavesdropping on Mama

Above all else it was the eavesdropping on a mobile telephone of Chancellor Angela Merkel that launched public concern. For many Germans, it was a personal attack against their leader. If the private life of “Mama” Merkel, as she was affectionately nicknamed, was not respected by the allied friends in America, what is our protection? Germans began to understand what big data in today’s world of espionage means: All public life is under constant government scrutiny.

The public was shocked.

Trust in the transatlantic alliance was, too.

“A blatant attack on the sovereignty of a democratic state,” complained Thomas Oppermann, chairman of the Intelligence Committee in the German *Bundestag*. “Anyone this brazen will have no inhibition about eavesdropping on mobile phones and e-mails of all citizens.”

“A serious breach of faith,” said the Federal Security Minister Hans Peter Friedrich. “Absolutely unacceptable,” cried Belgium’s Minister President Elio di Rupo. “Friendly nations simply should not eavesdrop upon one another,” added Austria’s Vice-Chancellor Michael Spindelegger. In the press there were countless comparisons with the surveillance apparatus of East Germany.

Their outrage was hypocritical. It is the job of intelligence services to spy on politicians in friendly nations. That’s true for skeptics of the U.S. alliance as well as for U.S. fans like Angela Merkel.

Secrets in the Kitchen

Despite close cooperation between the allied intelligence services, every government has secrets it wishes to keep secret. For this reason, the German *Bundesnachrichtendienst (BND)* stores many of its sensitive data on Israeli service in the Negev desert. Parliamentarians from

the Intelligence Committee of the German Bundestag are required to check mobile phones in a special electronics safe.

Particularly sensitive are the internal meetings of the Federal Cabinet. When the chancellor swings her cast iron bell to open the meetings in the electronically secure cabinet rooms she wants participants to feel safe. Ministers should be able to exchange opinions and information freely. Secrecy must be guaranteed. For this reason the protocols are recorded in steganography.

By hand.

With a pencil.

On paper.

Without any electronics.

To secure the protocol, the Germans have chosen a technology from the nineteenth century: a pneumatic tube system. The paper protocols are rolled into thin cylindrical containers and sucked through the system into the concrete cellar rooms of the *Kanzleramt*.

The system is not exactly high-tech.

But it is secure.

The Arsenals of the Killer Machines

Today's modern spies are high-speed computers. Their job is to identify the enemy in an ocean of millions. They search for dangerous needles in a hay stack of the harmless. They do their work with the cognitive capabilities of Artificial Intelligence.

Espionage computers identify the targets.

The military hunts them down.

Military Mosquitoes and Micro Weapons

"Think small," thought a colonel in the U.S. Air Force and envisioned a fleet of thousands of unmanned miniature air vehicles. Flying over enemy borders, unnoticed by ground troops, invisible by radar, the microscopic military mosquitoes could slip silently into foreign territory. Within hours, they could inflict enormous damage.

An enemy would be helpless.

The fleet that the colonel envisioned would consist of tiny flying robots, each smaller than a housefly, each fully flight capable and each, if necessary, armed. They could attack in swarms, locating foreign computers, inserting themselves into the hardware and provok-

ing a short circuit. Kamikaze-style they could clog the rifle barrels of enemy soldiers, or spray poison into their eyes.

Fantasies in a sci-fi film?

The latest shocker from Stephen King?

No. The colonel exists. His name is Joseph A. Engelbrecht, Jr. and his vision of robot insects is a part of the high level military study *Air Force 2025*, which was published under his direction at the U.S. Air Force Academy in Colorado Springs.

AI Assumes Control

It is worrisome to observe Artificial Intelligence assuming ever increasing responsibility for entire sectors of our society. This is especially true when it comes to superpower weapons systems. This becomes a serious threat when systems interconnect and begin developing systems and strategies of their own, ones not originally planned by their human creators.

That is the moment where we must fear that AI is escaping our control.

Even today, Artificial Intelligence is seeping deeper and deeper into civilian life. It recommends vacation destinations, flies us there on jets, guides us across foreign landscapes, and translates our wishes into foreign languages. Every Google search, with every Amazon purchase teaches AI more about us. And soon, it will be predicting our desires.

In our homes, robots are still our friends. One machine washes shirts and socks, another washes breakfast plates and silverware. As I write these lines a household machine from iRobot is mopping the kitchen floor. My wife refers to him affectionately as “Robbi.” We think he’s cool.

Less cool is the knowledge that espionage services are familiar with our wishes, even our most intimate ones. This is the world of big data—the full picture, total inventory. Theoretically the state is able to call up all of our data with a mouse click. If we don’t have suspicious habits, however, it probably won’t be interested in us. Normal citizens are the unimportant blades of grass in the gigantic haystack of big data.

But there are people who are interested in every blade of grass in the haystack.

They are powerful.
In dealings with them we should be very cautious.
Because they track us all for our entire lives.

Follow That Car

In the cinema, James Bond races from the airport, yelling to a taxi driver, "Follow that car!" A dramatic chase through an exotic city begins.

That is fiction.

With today's technology, it is also ancient history.

Automobiles are tracked silently—with navigational systems and satellites, CCTV and directional transmitters. In addition to the usual collection of navigational systems and GPS, which most people know, there are countless surveillance systems that can track any movement on any street. If we are being tracked, no one is visible in the rear view. We are tracked from a distance. We are tracked automatically. And there is no limit to the number of vehicles that can be tracked simultaneously. A modern-day James Bond might more appropriately command: "Follow those cars! All of them!"

For law enforcement, gas stations are important locations for the surveillance of vehicles. Sooner or later every vehicle needs fuel. Petrol stations are the choke point through which all must pass. Strategically placed surveillance cameras can identify stolen cars or wanted criminals, especially when the video is forwarded to a police station in real time.

A New Class Society

Consumers are constantly being sorted into categories. There are the valuable ones, who travel widely, consume generously, own much, and spend a lot of money. Then there are the others.

Who swims on the top, who sinks to the bottom? The best judges of this are the silent corporations who hold our data. The marketers of the million-dollar company are always seeking the high-end consumer. The businessman with the calendar full of appointments and the wallet full of credit cards. These are the true VIPs who are pampered by the data business. The gold card holder at the airport or hotel is greeted with red carpets and velvet ropes. Instead of a long wait he's given doubled miles, instead of luggage limitations he can hope for a free limousine service.

Credit card holders with high turnover are also treated with preference. They are connected immediately to the VIP hotline and treated graciously by elite staff. Their special call centers offer abbreviated waiting times and a generous selection of special offers and bonus packages that the ordinary customer never hears about.

Target customers are sorted to the top.

Others fall to the bottom. And have to wait.

In the call centers of the world, a new class society is being created.

David vs. Googliath

Google is one of the most powerful corporations in the world. A billion-dollar business with brutal market power. The German headquarter is located in the ABC-Strasse 19 in Hamburg. It is a playful venue with colorful walls, cheerful balloons and a relaxed working environment. Conferences are held alternatively in the re-creation of a subway car or the business class of a jetliner. Umbrellas hang from the ceiling in the cafeteria, in recreation rooms employees can choose between billiard and shuffle board, table tennis and other games. In a bubbly YouTube video young staffers are seen dancing through the hallways and singing:

“We are happy @ Google Hamburg.” Google, a venue for the light-hearted.

A few blocks down the street sits the David ready to challenge the powerful monolith of data. Professor Dr. Johannes Casper is chief of the data security offices of the Hamburg government. His offices are not so funny. The government official sits in a government building with antique desks, heavy bookshelves, and a view of a gray courtyard. It is a humorless setting in the building of the State Supreme Court with polished floors and rusting heaters. There is no table tennis here, no balloons, and no dancing cheer leaders.

The professor has a total of fourteen staffers. And they watch over not only Google. Hamburg is also German headquarters for Facebook, Twitter, and 160,000 other corporations dealing with big data. It is a heavy workload.

Professor Casper tries to project a strong image in TV talk shows and the press. Valiantly he battles internally for necessary funding. Courageously he warns of the dangers of the data monsters. But Professor Casper is a realistic man. He knows that with his modest means

he is hardly capable of limiting the growing influence of the powerful data broker.

Or of the surveillance society.

The Gangster and Data Protection

In the morning hours of August 22, 2009, David Leon Riley was cruising the suburbs of Dallas, Texas, in his Lexus. A local cop noticed that his inspection had expired and stopped him. Riley's driver's license had also expired and under the hood the officer discovered two loaded revolvers, hidden in an old sock.

Riley had a problem.

He was arrested.

The policeman confiscated both guns and Riley's telephone, an Instinct M800 smartphone from Samsung. On the chip there were convincing indications that David Leon Riley was a gang banger with the infamous street gang Bloods. GPS evidence also confirmed that he had been in the neighborhood of a lethal shooting two weeks before. Ballistic tests on the revolvers confirmed his involvement. It was a clear case.

At first.

The jury returned its verdict quickly, convicting the gang banger for attempted murder, assault with a deadly weapon, as well as gang membership. He was sentenced to fifteen years to life.

As Riley left the courtroom in his orange prison suit and leg irons, no one suspected that he would enter the annals of United States law as a champion of data protection. Riley's lawyers lodged an appeal.

The search of his smartphone without a court order was, in their opinion, unconstitutional. In June 2014, the U.S. Supreme Court confirmed them. "Today's smartphones are not just technological devices," wrote Chief Justice John Roberts. "They are guardians of the very core of private life." The case brought a fundamental restriction for police investigation. Without a court order, law enforcement was no longer permitted to search smartphones.

It was a small step.

But a significant one.

Birth of Google Brain

When Google began a research for a brain for its memory, it dispatched

its scouts to London. In an unobtrusive office building at 5 New Street Square they found what they were looking for: a dozen young programmers were toiling in secrecy in a company named *DeepMind*.

Papers and press releases were rare. Management said little. The corporate website was an empty screen. All one knew was that *DeepMind* was somehow involved in Artificial Intelligence.

Destruction of the Human Race

DeepMind was on the cutting edge of Artificial Intelligence. This was known to insiders. Their research work stimulated acute interest in Mountain View, California.

When Google knocked on their door, the start-up kids believed it was a miracle. The perfect dream of every start-up founder is the IPO. Or a potential buyer with deep pockets.

Google was a potential buyer. And Google had very deep pockets. Google offered over 500 million dollars for *DeepMind*. The company owners, you will think, would jump at the offer.

But they didn't.

It wasn't because of money, which would have turned them into very wealthy men on the spot. They were concerned about the potential of their research. The tinkerer on the Thames knew their creation was dangerous. Shane Legg, one of the founders, saw in their software "one of the greatest risks of the century." He was convinced that AI could play a major role in the extinction of humanity. Another compared it with "a Manhattan project in things Artificial Intelligence." The thought is not outlandish. Many scientists hold the danger potential of Artificial Intelligence quite comparable with atomic weapons.

So when they cut their deal with Google, they demanded conditions, very unusual conditions.

Google was required to set up an ethics commission within the company to watch over AI development.

Torches and Pitchforks

"Google Brain was a cool name," explains Jeff Dean, one of the pioneers. "Externally we tried to avoid it. Outsiders could misunderstand."

The Google company was fully aware that the development of a

super intelligence could trigger suspicions in the general population. Another Google insider put it this way: “We didn’t want an angry mob with torches and pitchforks appearing at our gates.”

In the year 2012 the project was given the new, less threatening name *DeepLearning*. The research was transferred from the top secret research Google X to the main campus. Managers wanted to signal normality. But the content of the department had reached a dimension that made even its own department heads a little nervous.

And Google began to develop strategies on how to deal with a being that one day would be many times smarter than the humans that invented it.

“In the end robotics will take control. It is completely clear that humanity cannot survive.” —Hans Moravec, Carnegie Mellon University

Google had always pursued a future-oriented acquisition strategy. In the past ten years the corporate giant focused on Artificial Intelligence. Systematically they purchased everything that could be useful to an AI company.

“Only a few know that Google was purchasing new companies every day,” writes blogger Jens Lehmann. He lists Google acquisitions between February 2001 and September 2014. In his list Lehmann included 170 companies. And those were only the ones Google officially published in its press releases.

The End of Biology

Human beings are hardly a final stage of evolution. Today we have already begun to tune our bodies and pimp our brains. Then what use is a rapidly increasing intelligence, when the bodily shell cannot keep up? The functions of organs such as heart, kidneys, or intestines can be replaced. Their tasks can be assumed by microscopic nanocomputers working inside our bodies. Our outer skin can be replaced by a resilient surface. Mankind morphing into machines. Not in one moment, but rather step by step, when the process is completed, we will have arrived at a new level of evolution.

Machine humans.

And the end of biology as we know it.

“The creation of a strong intelligence will be the most important transformation of this century,” Ray Kurzweil believes. “Its significance is comparable with the creation of biological life.” The moment

that machines surpass biological humanity will arrive around 2029, or so he predicts.

Other cultures pray to gods, hoping for heaven and believing in eternal life. Kurzweil believes in the singularity. It will bring the morphing of biological humanity and electronic perfection, the hope for immortality.

But what about feelings? Love and hate, lust and passion, frustration and joy, will they still be part of the picture? Human emotions paired with super human intelligence?

Or will computer intelligence remain cold, void of feeling and inhuman?

The Gentle Vision of Ray Kurzweil

In the brave new world of Ray Kurzweil mankind and machine live in harmony. They are friendly creatures, who populate his future—warm, wise, and rich on humor. They tell jokes, enjoy sex, and make us immortal. It is a comforting and quieting vision. But in truth we must ask ourselves, why an intelligence that is a million times smarter, should submit to an inferior humanity?

Dog?

Cat?

Ant?

The predictions of most AI researchers are less comforting. Their creatures are cold and calculating, invisible and out of control. They have an agenda that we do not know. They pursue plans that we do not understand.

They will destroy us, many predict.

Without us ever understanding why.

We're too stupid to understand.

tion for Poetry. She lives in Paris.

Jay Tuck, a US defense expert, was investigative journalist and executive news director of the daily network ARD German Television. In his 35 years there, he produced over 500 television segments. He served twice as combat correspondent in Iraq. His investigative reports on security policy, espionage activities, and weapons technology appear in leading publications in Europe, including *Cicero*, *Focus*, *Le Point*, *Stern*, *Welt*, and *ZEIT* magazine. Tuck is an internationally acclaimed speaker whose lively talks are accompanied by exclusive video and photographs. He is author of *High-Tech Espionage*, published in fourteen countries. For his current book, *Evolution Without Us*, he interviewed drone pilots and intelligence sources, futurists and Silicon Valley specialists in a 2 ½ year exclusive research. Up to now it has only appeared in German (Plassen Publishing) and Chinese (Shanghai University Press). His TED-Talk on AI has reached over 2 ½ million clicks.

The Poets

Morri Creech is the author of four collections of poetry, including *The Sleep of Reason*, a finalist for the 2014 Pulitzer Prize, and *Blue Rooms*, published last October. He has recently published poems in *Yale Review* and *Hopkins Review*. He lives in Charlotte, NC.

Michael Fulop lives a little north of Baltimore with his wife and two children, and he works as a psychiatrist. He has previously had poems published in *Green Mountains Review*, *The Hopkins Review*, *LIT*, *Poet Lore*, and *Prairie Schooner*.

Karen Kevorkian is the author of two poetry collections, *White Stucco Black*

Wing and Lizard Dream. A third book, *Quivira*, is to be published at the end of 2019. Her work appears in *The Antioch Review*, *Michigan Quarterly Review*, *Denver Quarterly*, *Colorado Review*, *Los Angeles Review of Books*, *Volt*, and elsewhere. She is a lecturer at the University of California, Los Angeles.

Karl Kirchwey is the author of seven books of poems, most recently *Stumbling Blocks: Roman Poems* (2017). He has edited *Poems of Rome* (2018) for the Everyman's Library Pocket Poets Series, and has translated from French and Italian. "The Stanza of Livia" is part of a long-poem-in-progress entitled "Muta-bor." He teaches in the MFA Program at Boston University, where he is currently serving as Associate Dean of Faculty for the Humanities.

Pedro Mairal, born in Buenos Aires in 1970, is a leading literary figure of his generation in Argentina. After the publication of his poetry collection *Tigre como los pájaros* (*Tiger as a Bird*, 1996) he rose to national fame with the breakthrough novel *Una Noche con Sabrina Love* (*A Night with Sabrina Love*, 1998). He was elected in 2007 to the "Bogotá39" as one of the best young Latin American writers of his time.

Skye Shirley is a poet and Latinist living in Florence, Italy. Originally from Boston, she spent the summer of 2019 as the Writer-in-Residence at the New Bedford Whaling Museum to complete her manuscript *Hardtack*, a collection of poems about the whaling industry and its impact on women in Massachusetts. Her poetry has been published in multiple journals, most recently *Mid-American Review*, *Passages North*, *Ruminate*, and *Post Road*.