**Advances in technology that will change your life.**

By Adrian Ashfield

The current situation is unsustainable and will rapidly get worse without change. Moore’s law spells it out: the power of computers doubles every 20 months or so. What is covered here is a review of the present, what is coming soon and possible solutions to the problem it is covered in more detail in Martin Ford’s book *Rise of the Robots* from which I have borrowed*.*

**The present.**

What we have seen in the recent past is winner takes all. The average production worker earned 13% less in 2013 than in 1979, while productivity increased by 103%. Productivity increases that used to go to workers pockets now goes entirely to the business and investors.

University of California Berkeley found between 2009 and 2012 that 95% of income gains went to the wealthiest 1% This lack of purchasing power in the general population results in the stagnant economy.

The US Bureau of Labor statistics reported the number of hours worked in the private section was 194 billion in1998 and the same in 2013 although the values of goods produced had risen by 43%, adjusted for inflation. The number of men in the labor force has declined since 1950. Meanwhile the population had grown by 40 million. 93 million adult Americans don’t work. A million new jobs a year are needed just to keep up with population growth. Official unemployment numbers are fictional and don’t count the numbers that have been sufficiently discouraged to leave the workforce permanently.

The popular political solution of more education is nonsense. As you will see in the section on the future the number of traditional jobs across the spectrum will decline. Most new jobs forecast will not require a university degree. A few more tradesmen will be required in the future to install and maintain automation. Workers “freed up” will not be going back to school for other better paying jobs, as there won’t be jobs to fill. College cost increased more than 500% while the consumer price index increased 121% The actual cost of instruction only went up less than 10% Sending more money there didn’t work. Student loans now total $1.2 trillion. Only 60% graduate within six years, the remainder has to pay off the debt without a degree. A CareerBuilder Survey finds 51% of employed 2014 college grads are in Jobs that don’t require a degree. Just 27 percent of college grads had a job that was closely related to their major. It seems universities are more interested in acquiring student fees than preparing them for the world. Harvard professor Clayton Christensen predicted that in 15 years half these institutions would be in bankruptcy.

Quantitative easing gave the banks additional reserves that the public were told was expected to be loaned out to help get the economy going. In fact the Feds discouraged this fearing it would cause inflation. The banks receive billions in interest from the Feds for money loaned to them at zero interest. The system is broken because the incentives are wrong. Mr. George Soros writes. “The banking sector is acting as a parasite on the real economy. The profitability of the finance industry has been excessive. For a while 35pc of all corporate profits in the United Kingdom and the United States came from the financial sector. That’s absurd.”

The Department of Justice crows about the multi-billion dollar fines but those are paid by the shareholders. Not a single senior bank executive responsible for the financial collapse has gone to jail. Not only are banks too big to fail, their executives are too big to jail. Banks do not create real value but are creative in siphoning off wealth from the rest of the economy. They allocate the gains to the richest people. They are corrupt and getting worse. They need to be broken up and encouraged to lend to the entrepreneurs who will build the new robotic economy.

Off shoring is really virtual immigration No one seems to object to the highly skilled jobs exported electronically, jobs that Americans want. All the fuss is about low skilled immigration workers doing jobs Americans don’t want.

Google, Apple, Facebook and Amazon combined have about a $trillion in capitalization yet employ only 150,000 people. That is less than the number of new entrants to the job market each month.

The lack of jobs is the onset of a growing problem. When mechanization made workers redundant, like the reduction of farm workers from nearly half the working force to less than 2% now, the displaced workers could find better paying jobs in manufacturing. Now robotics is starting to replace jobs across the spectrum doing the job better and cheaper than humans can. There are fewer jobs for the displaced workers to go to. iRobots said their basic robot can do a simple repetitive task for $3.40 per hour.

Already some manufacturing is being repatriated from low wage countries. Phillips repatriated the manufacture of shavers from China to Holland using robots. Warehouses like Amazon’s are automated with the goods from their immense warehouse being brought to the human packer.

Some manufacturing facilities are fully automated like Tesla’s car factory. See the video by *Wired* for a view of it in action.

Secretaries and call centers have been replaced and more office work is done by computers. E-discovery is used by law firms for “discovery,” a job that used to take hundreds of people searching through thousands of files. The computer program Quill already writes many of the sports, political stories and company reports you read. It is forecast to write 90% of them in fifteen years. Two thirds of stock trades are now decided by computer and companies pay $millions to reduce connection time by a few millionths of a second to trick the other computers and do it first.

Anesthesiology requires four years of training after medical school resulting in the profession’s median salary of $277,000 a year. The FDA has approved a robot to do the job for simple surgeries.

Some pharmacies like that of University of California San Francisco are already fully automated providing 10,000 doses per day. This eliminates human error as well as the humans. This will spread and many highly paid Pharmacists will become unemployed.

**The near future.**

Three years after the first vacuum tube computer, Norbert Weiner (PhD at 17) wrote:

“If we can do anything in a clear and intelligible way, we can do it by machine. An industrial revolution of unmitigated cruelty powered by machines capable of reducing the economic value of the routine factory employees to a point at which he is not worth hiring at any price.”

University studies have shown up to 50% of 700 jobs analyzed can be fully automated. This leads to loss of jobs because robots replace humans rather than just providing better tools for humans to use.

Within another three or four generations of robots they will be capable of replacing most human workers. Unskilled workers doing repetitive jobs are the first target, effecting China and India as well as America. Manufacturing has already started being repatriated as it is cheaper to use robots than low cost labor. Robotics is working its way up the food chain where labor is expensive to the point where few are safe. If Watson could win Jeopardy ten years ago, consider what it will be capable of in another ten years of Moore’s law. It has already migrated to the cloud in 2013 and is available anywhere. With its ability to scan millions of papers and reports, early tests show it can diagnose illnesses as well as a human doctor. Health care is an obvious target for robotics. In 1960 healthcare cost less than 6% It has tripled to 18% by 2013. Healthcare in the US now costs more than double that of other advanced nations. Hospital medical errors are responsible for >100.000 deaths a year and robotics will reduce that number, eliminate defensive medicine and protect against medical liability.

The US Bureau of Labor ranked combined food preparation and serving workers in the fast food type industry as being a major source of employment up to 2022. This ignores that there is already a prototype robot designed to produce 300 gourmet hamburgers, made to order, per hour. Japan’s Kura restaurants have a fully automated sushi service including the bill and cleaning up, undercutting the competition.

Retail sales is another large employer that can be automated and buying on line is already cutting into that. Warehouses are being automated and possibly drones will deliver the goods.

Aircraft are capable of flying from one airport to another on autopilot but it will be some time before passengers are prepared to board an airplane without a pilot. They probably won’t mind boarding a driverless taxi. Can driverless trucks be far behind driverless cars?

How to look after an aging population is another problem Western countries have. Japan will be the leader of robotic health care as they are facing a population with 30% older than sixty five. Everything will be known about an individual through the collection and analysis of “big data.” Which is why companies like Facebook are so valuable.

Surprisingly America is far behind other countries for speed and price of the internet. Broadband in cities that license monopoly services is slow and expensive. This will change.

Like most new technology it can be used for good and bad. The possibilities are unlimited for military applications. Consider our drones, operated from here to bomb in other lands. DARPA is researching a variety of lethal mobile robots. It is possible to have a cloud of miniature flying drones that can enter buildings and leave a human with little hope of defense. Currently the claim is a human will be left in the loop for the decision to fire but that could change in an instant. The drone technology could well be used to control agricultural machinery on a farm from a distance. Automated vertical farms for fresh vegetables in or near cities have already been demonstrated.

With so many disruptive technologies on the horizon it is delusional to forecast just what will happen, particularly the time line. But today it looks like up to 50% of the current workforce will be made redundant.

**Possible solutions.**

The Triple Revolution (Cybernation.  Weaponry,  Human Rights)was an open letter, signed by notables, sent to President LB Johnsonon March 22, 1964. Although now dated, the problems of automation were foreseen. All have been ignored to some extent and it will take a brave politician, considering how their elections are funded, to state the obvious that American adventurism can longer be sustained and that the new unemployed must be supported.

History shows that when wealth inequality reaches a certain point, unless it is redistributed there will be a revolution. There are examples of both ways: Rome failed to redistribute and the Western Roman Empire collapsed. Athens managed to redistribute wealth and survived for a while. Will Durant’s book *The Lessons of History* gives many examples. Durant also points out that following redistribution of wealth the government must allow its reaccumulation by the few to ensure future progress. The failure of Communism in Russia showed what happens if you ignore human nature and don’t allow that.

 One possible way of avoiding the looming conflict is conversion to a welfare system like the Scandinavian countries employ. It does seem to be successful for them and surveys show they are considered the best places to live. At least it might be a good transitional route.

The other possibility is a guaranteed Universal Basic Income (UBI), high enough to live on, given to every adult citizen in the country with no strings attached. Many object to the thought of giving money to the idle. Free marketers have to face the obvious, which is that the modern American economy doesn’t provide enough income distribution to preserve civility in our society.  Some say it is only sharing society’s accumulated wealth. I will leave the moral justification to others. The main objective is to avoid a revolution that would cost a lot more than UBI both in lives and treasure.

A UBI differs from welfare as follows:

* it is being paid to individuals rather than households;
* it is paid irrespective of any income from other sources;
* it is paid without requiring the performance of any work or the willingness to accept a job if offered.

Many prominent European social scientists have now come out in favor of basic income - among them two Nobel laureates in economics. Alaska has a modest UBI instituted by a Republican governor, based on the profits from oil from Prudhoe Bay. This amounts to $300 - $2000 a year for every resident of more than six months. Switzerland had a referendum on whether to have a $28,000/year UBI in 2014 that didn’t pass. Perhaps a full UBI could be tried experimentally in a State or even a city, substituting for all welfare payments, to find out the problems.

Work has been a necessity but has no intrinsic virtue. Many hate their jobs. Surely having more leisure time is not bad. Families will be better able to look after each other in illness and old age. It is likely many unemployed on UBI will still want to work both to make more money and for the first time allow some to do what they enjoy, like to be musicians or artists, or a mother to stay with her kid when it’s a baby. Certainly the entertainment industry will grow. Advanced sexbots that can move and talk will be available, possibly threatening reproduction rates.

UBI together with robotics and cheap energy from LENR (Low Energy Nuclear Reaction) aka cold fusion, should finally win the war on poverty and significantly raise the standard of living for most. The new money circulating should stimulate the current economy as the sluggish recovery is due to most having too much debt and not enough money to spend beyond necessities.

Social unrest will not help run better companies, raise healthier children or allow one to walk down the street unmolested.  This is a pragmatic solution.  Hungry people, especially parents of hungry children, cause unrest.