February 2014

TRENDEVENTS

Welcome to the February issue of TrendEvents, featuring an in-depth review on Big Data, as well as an introduction to the Technocracy Design.

TECHNOCRACY IN ACTION

The York, Pennsylvania section shows the colors at its meeting place, where members take action to promote Technocracy. Local community efforts are an important part of educating people about Technocratic principles such as functional government.

NEWS

- **Climate Likely to Be Catastrophic**
  (*Huffington Post*, December 31, 2013)

  A report which takes a new look at the effect of clouds on climate change states that computer models show a 4 degree C increase (7.2 degrees F) by 2100. The lead researcher described the impact as catastrophic rather than dangerous. The report was published in the journal *Nature*.

Starvation, poverty, war and disease are likely to get worse due to climate change. Life would be impossible in some regions.

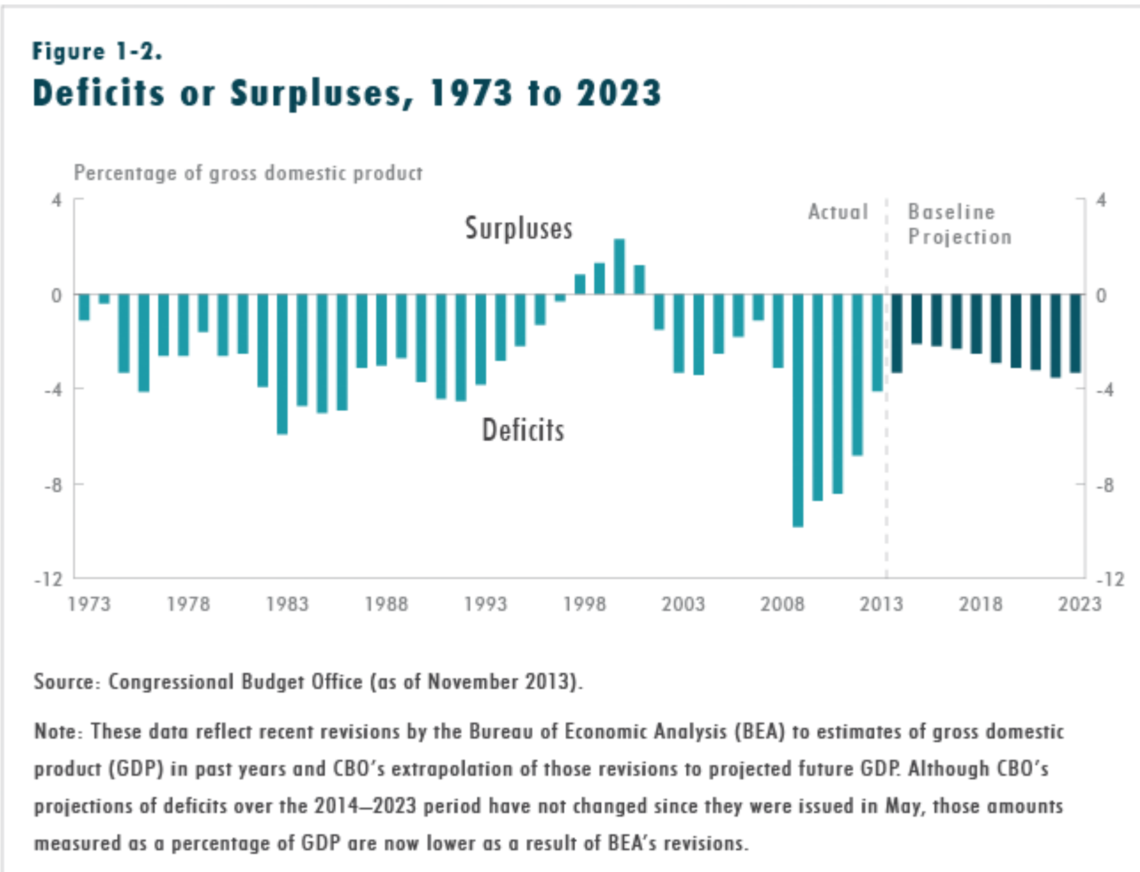
ECONOMIC DASHBOARD

- **Canadian economy beats forecasts but analysts see 'mixed bag'**
  (*Globe and Mail*, February 28, 2014)

  The Canadian economy grew at 2.9% to beat expectations, due to oil-and-gas, mining and household consumption, despite declines in construction and agriculture. However economists warn that much of the growth was due to debt-burdened households.

- **U.S. Budget deficits continue to persist**
  (*Congressional Budget Office*, 2014)

  U.S. budget deficits are projected to remain persistent. Despite recent improvements and a slight economic upturn, deficits are projected to increase starting in 2016. (See below).



Projected U.S. budget deficits 2014–2023

SCIENTIFIC LIES

"Trouble at the Lab", *The Economist*, October 19, 2013;

A few years ago scientists at Amgen, an American drug company, tried to replicate 53 studies that they considered landmarks in the basic science of cancer, often co-operating closely with the original researchers to ensure that their experimental technique matched the one first used. According to a piece they wrote last year in *Nature*, a leading scientific journal, they were able to reproduce the original results in just six. Months earlier Florian Prinz and his colleagues at Bayer Health Care, a German pharmaceutical giant, reported in Nature Reviews Drug Discovery, a sister journal, that they had successfully reproduced the published results in just a quarter of 67 seminal studies.

Academic scientists readily acknowledge that they often get things wrong. But they also hold fast to the idea that these errors get corrected over time as other scientists try to take the work further. Evidence that many more dodgy results are published than are subsequently corrected or withdrawn calls that much-vaunted capacity for self-correction into question. There are errors in a lot more of the scientific papers being published, written about and acted on than anyone would normally suppose, or like to think.

Various factors contribute to the problem. Statistical mistakes are widespread. The peer reviewers who evaluate papers before journals commit to publishing them are much worse at spotting mistakes than they or others appreciate. Professional pressure, competition and ambition push scientists to publish more quickly than would be wise. A career structure which lays great stress on publishing copious papers exacerbates all these problems. “There is no cost to getting things wrong,” says Brian Nosek, a psychologist at the University of Virginia who has taken an interest in his discipline’s persistent errors. “The cost is not getting them published.”

BLAME THE REF

The idea that there are a lot of uncorrected flaws in published studies may seem hard to square with the fact that almost all of them will have been through peer-review. This sort of scrutiny by disinterested experts—acting out of a sense of professional obligation, rather than for pay—is often said to make the scientific literature particularly reliable. In practice it is poor at detecting many types of error.

John Bohannon, a biologist at Harvard, recently submitted a pseudonymous paper on the effects of a chemical derived from lichens on cancer cells to 304 journals describing themselves as using peer review. An unusual move; but it was an unusual paper, concocted wholesale and stuffed with clangers in study design, analysis and interpretation of results. Receiving this dog’s dinner from a fictitious researcher at a made up university, 157 of the journals accepted it for publication.

Dr. Bohannan’s sting was directed at the lower tier of academic journals. But in a classic 1998 study Fiona Godlee, editor of the prestigious British Medical Journal, sent an article containing eight deliberate mistakes in study design, analysis and interpretation to more than 200 of the BMJ’s regular reviewers. Not one picked out all the mistakes. On average, they reported fewer than two; some did not spot any.

Another experiment at the BMJ showed that reviewers did no better when more clearly instructed on the problems they might encounter. They also seemed to get worse with experience. Charles McCulloch and Michael Callaham, of the University of California, San Francisco, looked at how 1,500 referees were rated by editors at leading journals over a 14 year period and found that 92% showed a slow but steady drop in their scores.

Replication is a hard and thankless job. Many researchers do not provide enough information to properly replicate their work. Many do not provide the original data on which their research is based. Often researchers are using software that is so highly sophisticated that they do not understand what it is doing to produce conclusions they are basing their research upon. Journals tend to discriminate against papers that produce negative results. Many in the scientific community are aware of these shortcomings and are attempting to do something about it but funding the work is a big problem. Even when a serious error is pointed out to a scientist he can be reluctant to admit to it for fear of damage to his reputation.

COMMENTARY BY RON MILLER:

It is doubtful that many of these errors are deliberate. It most certainly is a strong indication that more and better education on the subtleties of the scientific method are needed. It is clear that if the federal government were to fund the nation's universities where science is taught so that they could do replications conducted by graduate and postgraduate students that much of this problem would likely disappear. It also seems that many journals do not understand, in their battle for more readers, that proof that something is not true is just as valuable information as finding out what is true.

Researchers would be better off with more knowledge about the statistical handling of data. Statistics is a massive area of mathematical thought. Experts exist in all fields and scientists who are unfamiliar with the area under consideration would be well advised to ask those in the field for assistance.

BIG DATA

Cukier and Mayer-Schoenberger wrote an article entitled "The Rise of Big Data" in the May-June 2013 issue of *Foreign Affairs* outlining the current state of data analysis. Parts and pieces are taken from that article.

"In the third century BC, the Library of Alexandria was believed to house the sum of human knowledge. Today, there is enough information in the world to give every person alive 320 times as much of it as historians think was stored in Alexandria's entire collection–an estimated 1,200 exabytes' worth. If all this information were placed on CDs and they were stacked up, the CDs would form five separate piles that would all reach to the moon.

"The explosion of data is relatively new. As recently as the year 2000, only one-quarter of the world's stored information was digital. The rest was preserved on paper, film, and other analog media. But because the amount of digital data expands so quickly–doubling around every three years–that situation was swiftly inverted. Today, less than two percent of all stored information is nondigital.

"The way people handled the problem of capturing information in the past was through sampling. When collecting data was costly and processing it was difficult and time consuming, the sample was a savior. Modern sampling is based on the idea that, within a certain margin of error, one can infer something about the total population from a small subset, as long as the sample is chosen at random. Hence, exit polls on election night query a randomly selected group of several hundred people to predict the voting behavior of an entire state. For straight-forward questions, this process works well. But it falls apart when we want to drill down into subgroups within the sample. What if a pollster wants to know which candidate single women under 30 are most likely to vote for? How about university-educated, single Asian American Women under 30? Suddenly, the random sample is largely useless, since there may be only a couple of people with those characteristics in the sample, too few to make a meaningful assessment of how the entire subpopulation will vote. But if we collect all the data the problem disappears.

"This example raises another shortcoming of using some data rather than all of it. In the past, when people collected only a little data, they often had to decide at the outset what to collect and how it would be used. Today, when we gather all the data, we do not need to know beforehand what we plan to use it for. Of course, it might not always be possible to collect all the data, but it is getting much more feasible to capture vastly more of a phenomenon than simply a sample and to aim for all of it. Big data is a matter not just of creating somewhat larger samples but of harnessing as much of the existing data as possible about what is being studied. We still need statistics; we just no longer need to rely on small samples."

There is a tradeoff to make, however. When we increase the scale by orders of magnitude, we might have to give up on clean, carefully curated data and tolerate some messiness. This runs counter to how people have tried to work with data for centuries. Yet the obsession with accuracy and precision is in some ways an artifact of an information-constrained environment. When there was not that much data around, researchers had to make sure that the figures they bothered to collect were as exact as possible. Tapping vastly more data means that we can now allow some inaccuracies to slip in (provided the data set is not completely incorrect), in return for benefitting from the insights that a massive body of data provides.

Consider language translation. It might seem obvious that computers would translate well, since they can store lots of information and retrieve it quickly. But if one were to simply substitute words from a French-English dictionary, the translation would be atrocious. Language is complex. A breakthrough came in the 1990s, when I.B.M. delved into statistical machine translation. It fed Canadian parliamentary transcripts in both French and English into a computer and programmed it to infer which word in one language is the best alternative for another. This process changed the task of translation into a giant problem of probability and math. But after this initial improvement, progress stalled.

Then Google barged in. Instead of using a relatively small number of high-quality translations, the search giant harnessed more data, but from the less orderly Internet—"data in the wild," so to speak. Google inhaled translations from corporate websites, documents in every language from the European Union, even translations from its giant book-scanning project. Instead of millions of pages of texts, Google analyzed billions. The result is that its translations are quite good—better than IBM's were—and cover 65 languages. Large amounts of messy data trumped small amounts of cleaner data.

These two shifts in how we think about data—from some to all and from clean to messy—give rise to a third change: from causation to correlation. This represents a move away from always trying to understand the deeper reasons behind how the world works to simply learning about an association among phenomena and using that to get things done.

Of course, knowing the causes behind things is desirable. The problem is that causes are often extremely hard to figure out, and many times, when we think we have identified them, it is nothing more than a self-congratulatory illusion. Behavioral economics has shown that humans are conditioned to see causes even where none exist. So we need to be particularly on guard to prevent our cognitive biases from deluding us; sometimes, we just have to let the data speak.

Take UPS, the delivery company. It places sensors on vehicle parts to identity certain heat or vibration patterns that in the past have been associated with failure in those parts. In this way, the company can predict a breakdown before it happens and replace the part when it is convenient, instead of on the side of the road. The data does not reveal the exact relationship between the heat or the vibration patterns and the part's failure. They do not tell UPS why the part is in trouble. But they reveal enough for the company to know what to do in the near term and guide its investigation into any underlying problem that might exist with the part in question or with the vehicle."

"Big data could become Big Brother. In all countries, but particularly in nondemocratic ones, big data exacerbates the existing asymmetry of power between the state and the people.

The asymmetry could well become so great that it leads to big-data authoritarianism, as a possibility vividly imagined in science fiction movies such as Minority Report. That 2002 film took place in a near-future dystopia in which the character played by Tom Cruise headed a "Precrime" police unit that relied on clairvoyants whose visions identified people who were about to commit crimes. The plot revolves around the system's obvious potential for error and, worse yet, its denial of free will.

Although the idea of identifying potential wrongdoers before they have committed a crime seems fanciful, big data has allowed some authorities to take it seriously. In 2007, the Department of Homeland Security launched a research project called FAST (Future Attribute Screening Technology), aimed at identifying potential terrorists by analyzing data about individuals' vital signs, body language, and other physiological patterns. Police forces in many cities, including Los Angeles, Memphis, Richmond, and Santa Cruz, have adopted "predictive Policing" software, which analyzes data on previous crimes to identify where and when the next ones might be committed.

For the moment, these systems do not identify specific individuals as suspects. But that is the direction in which things seem to be heading. Perhaps such systems would identify which young people are most likely to shoplift. There might be decent reasons to get so specific, especially when it comes to preventing negative social outcomes other than crime. For example, if social workers could tell with 95 percent accuracy which teenage girls would get pregnant or which high school boys would drop out of school, wouldn't they be remiss if they did not step in to help? It sounds tempting. Prevention is better than punishment, after all. But even an intervention that did not admonish and instead provided assistance could be construed as a penalty–at the very least, one might be stigmatized in the eyes of others. In this case, the state's action would take the form of a penalty before any act were committed, obliterating the sanctity of free will.

Another worry is what could happen when governments put too much trust in the power of data. In his 1999 book, *Seeing Like a State,* the anthropologist James Scott documented the ways in which governments, in their zeal for quantification and data collection, sometimes end up making people's lives miserable. They use maps to determine how to reorganize communities without first learning anything about the people who live there. They use long tables of data about harvests to decide to collectivize agriculture without knowing a whit about farming. They take all the imperfect, organic ways in which people have interacted over time and bend them to their needs, sometimes just to satisfy a desire for quantifiable order."

"Big data is poised to reshape the way we live, work, and think. A worldview built on the importance of causation is being challenged by a preponderance of correlations. The possession of knowledge, which once meant an understanding of the past, is coming to mean an ability to predict the future. The challenges posed by big data will not be easy to resolve. Rather, they are simply the next step in the timeless debate over how to best understand the world."

A price system tends to warp everything it touches. The making of money supersedes all other interests. Large corporations will, very likely, make much better use of such data operations than governmental structures with public interest at heart. One need look no further than the privatization of the prison system. The real objective is to keep prisons as full as possible. Prisons have objected to the release of prisoners even when they have been found to be innocent of the charges they were locked up for. The use of prisoners as very cheap labor is also lucrative. On a per capita basis the U.S. now has more people under lock and key than any other nation. The use of big data will quite possibly just accelerate trends already visible and opposed to the well being of the society as a whole.

TECHNOCRACY: THE DESIGN

(From Lesson 22 of the Technocracy Study Course)

In the preceding lessons we learned that the events occurring on the earth are events of matter and energy, and that they are limited by the fundamental properties of matter and energy. In addition to this we have noted some of the more important characteristics peculiar to organisms, and singling out one particular species, man, we have followed its rise to supremacy during the past several thousands of years.

We have observed that this rise of the human species and corresponding adjustments, both up and down, of the other species or organisms, have been due almost entirely to the fact that the human species has progressively accumulated new and superior techniques by which a progressively larger share of the available energy could be converted to its uses.

We have seen that notwithstanding the fact that this progression has been slowly under way since times prior to the records of written history, the greater part of this advance, in actual physical magnitude, has occurred since the year 1900, or within the lifetime of nearly one-half of our present population.

It is due to the progress of these last few decades, that for the first time in human history, whole populations in certain geographical areas have changed over from a primary dependence upon agriculture for a livelihood to a primary dependence upon a technological mechanism, constructed principally from metals obtained from the minerals of the earth, and operated in the main from the energy contained in fossil fuels preserved within the earth.

Hence, this technological development has come to be localized in those geographical areas most abundantly supplied with the essential industrial minerals, such as the ores of iron, copper, tin, lead, zinc, etc., and the fossil fuels, coal and oil. We have observed further, that the Continent of North America ranks first among all the areas of the earth in its supply of these essential minerals, with western Europe second. Consequently, this technological development has reached its greatest heights in the areas bounding the North Atlantic with the production or rate of conversion of extraneous energy per capita having reached a far greater advancement in North America than in Europe.

22.1 The Arrival of Technology

We have also reviewed some of the paradoxes and the problems that have arisen in North America due to the conflict between the physical realities of this technological mechanism, and the social customs and folkways handed down from countless ages of low-energy agrarian civilizations.

It is to the problem of the elimination of this conflict that we now turn our attention, but before proceeding further let us get it entirely clear as to just what the conflict is.

In the past we operated more or less as independent productive units. The industry of the whole population was agriculture and small-scale, handicraft manufacturing. The interdependence among separate productive units was slight, or they were so loosely coupled that the opening up or shutting down of one unit was of slight consequence to the others. This was because any given essential product was not produced by one or two large establishments, but by innumerable small ones. The total output of that product was the statistical result of all the operations of all the separate, small establishments. Consequently, the effect of the opening or closing of any single establishment was negligibly small as compared with the total output of all establishments. The probability that a large fraction of all establishments of the same kind would open and close in unison was also negligibly small.

In the past, human labor, while not always the sole source of power, was so essential a part of the productive process that, in general, a decrease in the rate of production only took place when there was also an increase in the number of man-hours of human labor expended. During periods in which there was no technological improvement this relationship between production and man-hours was one of strict proportionality. ***[To be continued in the March issue.]***

FEBRUARY'S FEATURED VIDEO

Speaking of media, Technocracy has a full set of online introductory videos. Since it is the beginning of the year, this month's featured video is "#8: Price System" by Ron Miller at: http://www.technocracy.org/about-technocracy

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2475 Harksell Rd
Ferndale, WA 98249-9764

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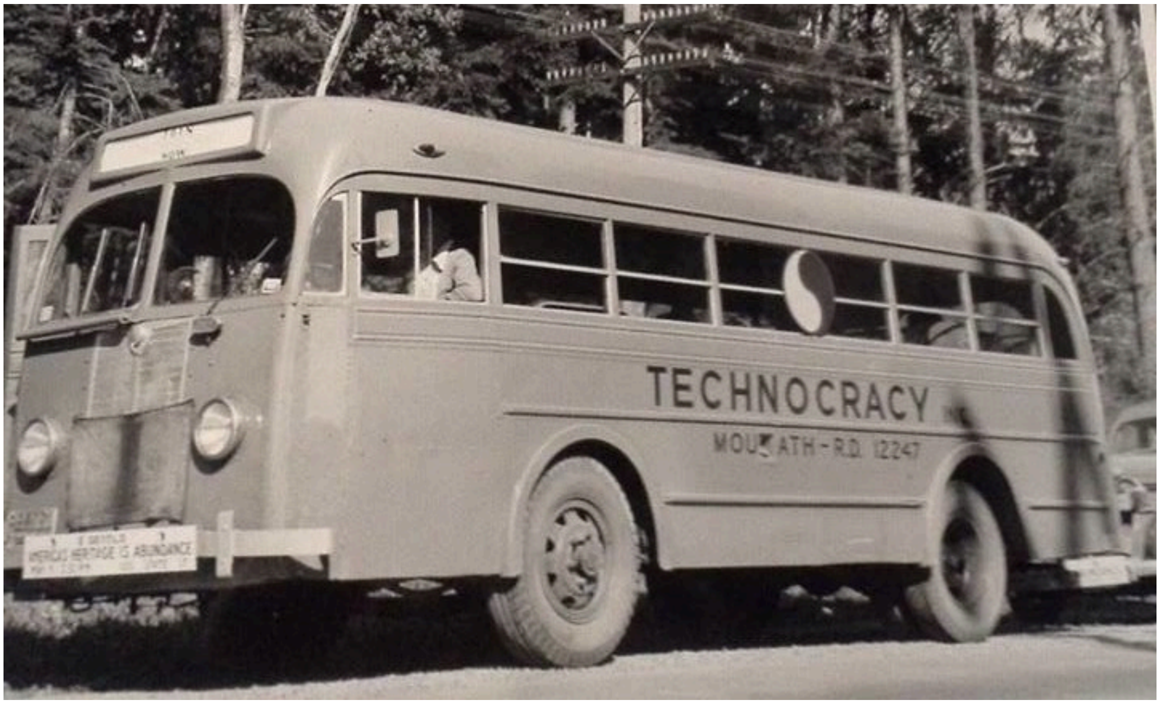

Technocracy, Inc.
2475 Harksell Rd
Ferndale, WA 98249-9764
USA