March-April 2014

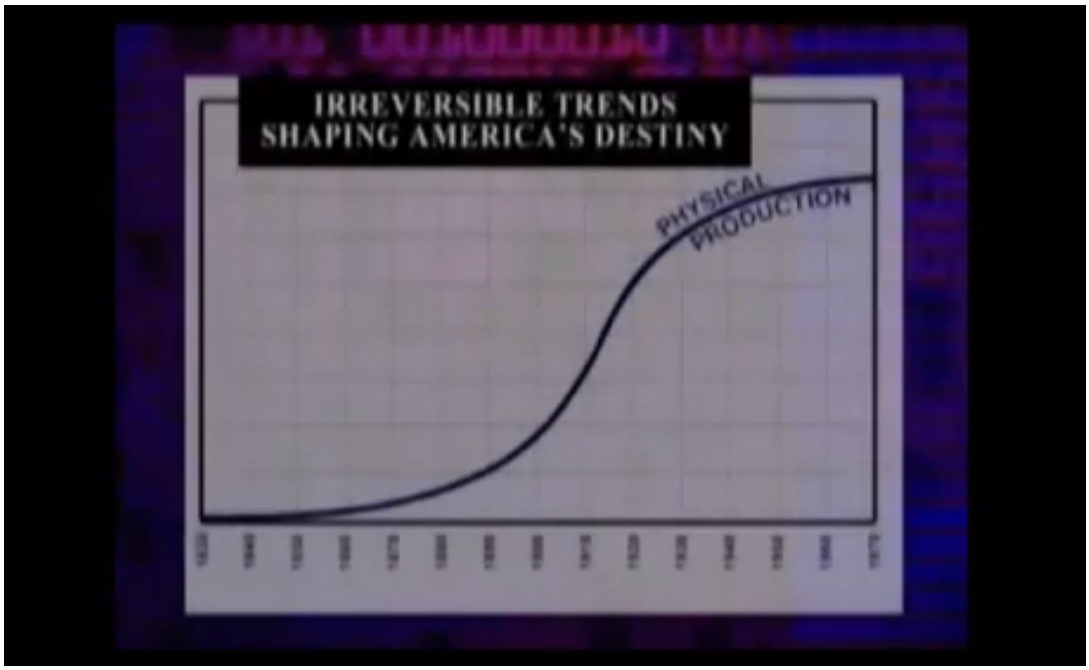
TRENDEVENTS

Welcome to the March-April issue of TrendEvents, featuring an in-depth review on Energy Distribution by Ron Miller, as well as an excerpt on Production from the Technocracy Study Course. A recurrent theme in this issue is how modern production can achieve economies of scale that can benefit our standard of living, but how these economies can also ensnare us in the problems of the Price System.

TECHNOCRACY IN ACTION

FEATURED VIDEO

This month's featured video is "#8: Extraneous Energy" by Ron Miller at: http://www.technocracy.org/about-technocracy, from Technocracy's set of online introductory videos.



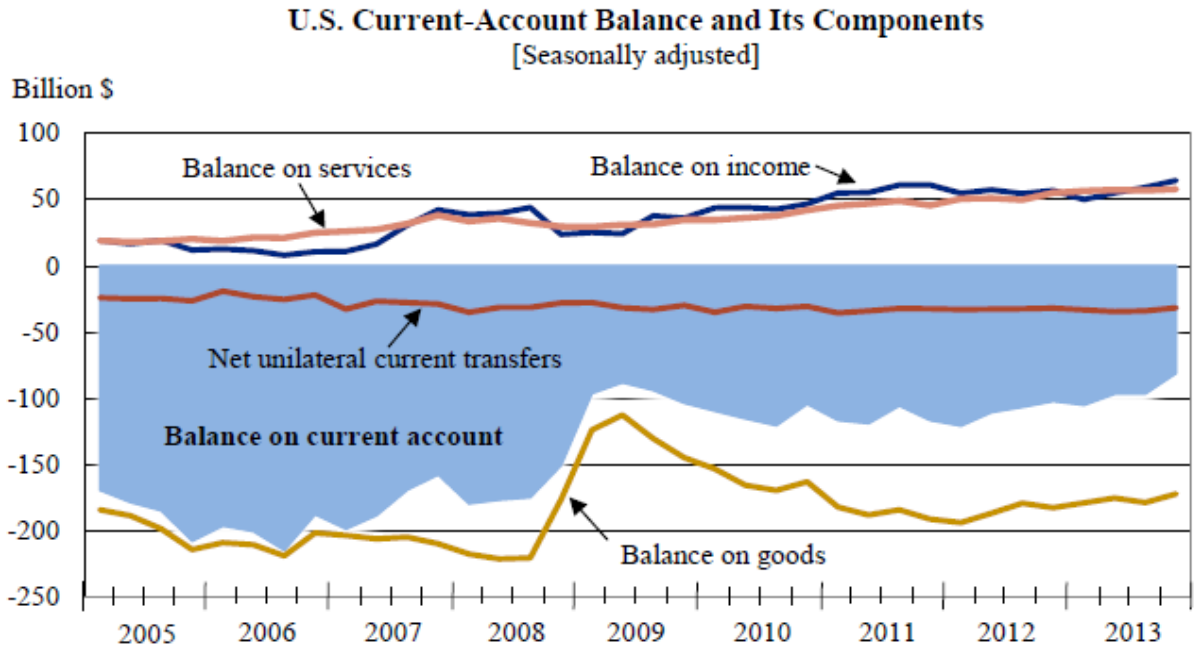
NEWS

- **Loonie ends sharply lower on Gloomy Bank of Canada Economic Forecast**
(*Globe and Mail*, March 18, 2014)

"Slower-than-normal growth may be the new norm for Canada and the world and that will require central bankers to keep interest rates low for longer than they would have in the past," according to Stephen Poloz, Governor of the Bank of Canada. However, "the loonie had also benefited from a willingness to take on risk" because of mildness of sanctions against Russia thus far.

- **U.S. Trade Deficit Remains at over $170 billion per quarter**
(*U.S. Bureau of Economic Analysis*, March 19, 2014)

The U.S. final quarter of 2013 trade deficit was $171.8 billion. While this is a slight improvement, it still represents a tremendous manufacturing gap. As a country, the USA does not make much of what it needs. Previous TrendEvents' reviews show that Canada is in a similar manufacturing gap. (See below).



- **Bitcoin Exchange Mt. Gox Files for Bankruptcy, Hit With Lawsuit**
(Yoshifumi Takemoto and Sophie Knight, *Reuters*, February 28, 2014)

Bitcoins are a new virtual currency that, collectively, are worth billions of dollars. Popular because no government controls them, anyone can generate them using computers, and they are highly portable, so they are highly popular with techies, libertarians and even criminals.

Recently, Mt. Gox, one of the largest exchanges of bitcoins (in a sense, a bank for bitcoins) discovered that it had several hundred million dollars stolen by cyber criminals. Bitcoins are not government-insured, so depositors lost a pretty big part of their virtual wallets. Nevertheless, bitcoins remain popular and widely used.

ENERGY DISTRIBUTION

Human societies exist to promote the well-being of the people in them. The larger the society, as a rule, the better the society is capable of operating. A larger society generally covers more space providing more resources both physical as well as human. More people mean a greater spread of talents, interests and abilities.

Probably the most important function of the society is defense against external enemies. The next would be to provide the maximum level of tranquility so that people can go about their business without concern for their safety. Needless to say how every society defines and operates in these areas is quite different.

A PRICE SYSTEM

The ancient Greek city-state of Lydia was very likely the first society to operate its social structure using a price system in approximately 500 BCE. The society consisted mostly of farmers and artisans as well as those providing services to the farm community. With a simple social structure such as this, a price system works well enough. Yet, there is trouble when the system begins the use of ever increasing amounts of energy. The results are what we see today. Most perceive it as a greatly increased standard of living but few see the rather strange distortions created as a result of price system operation. These distortions could put an end to our social order or, at a minimum, distort it beyond all recognition.

If the price of food drops too low the farmers may be forced out of business. But if the price of food rises to the point where the farmers are doing well many people could be going hungry. In the U.S., huge amounts of money are being made producing military equipment. Little will (we hope) ever see any use. As it becomes obsolete, it is scrapped or dumped to be replaced with the next generation of canned devastation. Apparently even the Pentagon is unaware of just how many overseas bases the U.S. has, but the number is probably about 1100. Why? The U.S. has eleven aircraft carrier groups. Our nearest competitor, England, has one. Why do we need eleven? Huge amounts of resources are consumed with little to no social benefit except to those who build them, operate them and maintain them.

Generations of scientific study has warned of the serious consequences of global climate change. Nothing happens because it would interfere with business operations. There is little doubt that almost any other person could assemble a comparable list. As wealth becomes concentrated in fewer and fewer hands, social operations become increasingly creaky as distortions pile ever higher.

A price system operates when people are paid for what they produce. For this reason, jobs are a major concern in our society. Without jobs a price system cannot function. The replacement of man-hours with energy mostly from fossil fuels has dramatically increased human

productivity. We have now developed machines that, in many cases, can replace us. This is the sort of thing that can destroy a price system.

TECHNOCRACY'S ANALYSIS

Technocracy saw the replacement of people with machines in the 1920's and realized that this would, eventually, destroy the price system. Rather than see this as a disaster, it was realized that this was a tremendous opportunity to construct the next level of human social organization. A society based on the use of energy rather than money. Energy is a physical quantity whereas money is a fictitious construct. All one has to do is realize that, at its core, the universe only consists of two things—matter and energy. The reason we have such a high standard of living is that we produce so much energy other than humans or animals. All Technocracy said was measure it and use the laws of thermodynamics to control it using what it has called energy certificates. Just how would such a system work?

To measure the energy output of North America it is necessary to measure the total output of electricity however it is produced. Plus all the energy produced just from the consumption of fossil fuels not used to produce electricity. That would give one the energy produced for the time period one was measuring. From that total would be deducted the amount required for maintenance and construction of new facilities. What is left would be divided equally between the citizens.

The amount of energy consumed in the production of almost anything is seldom measured although it is not difficult to do. What one has to do is to measure the total energy input to the productive process over a period of time plus the energy content of any raw material used and divide that by what is produced. To that would have to be added transportation and handling costs for the product as it sits on the shelf. The consumer would have that amount deducted from their share of energy costs. Such a system would, very likely, leave large amounts unused at the end of the budgeting period.

One person saving money very likely means that someone else is doing without or, at a minimum, doing with less than they would like or need. "Money is the nothing, you get for something before you can get anything," said Frederick Soddy (1877-1956). Currently in the U.S. food and shelter could be provided for all. It doesn't happen. If one operates a society based on energy production and distribution no one really loses. For the most part computers would easily track and do the necessary recording at all points.

MIT Technology Review, March/April 2013 issue reports on a GE plant for the production of advanced sodium-nickel batteries. The factory has 10,000 sensors in an 180,000 sq. ft. area connected to high speed Ethernet. They monitor things such as which batches of powder are being used to form the ceramics at the heart of the of the batteries, how high a temperature is being used to bake them, how much energy is required to make each battery, and even the local air pressure. Every part that goes into the batteries gets tracked with serial numbers and bar codes; if managers want to assess how much energy it took to make a specific battery part and compare it with the average, or study a day's production, they can do ad hoc analyses on powerful workstations. Eventually the idea is to track batteries after they leave the plant using imbedded chips. Other GE divisions have similar plans for

keeping tabs on people's refrigerators and dishwashers.

For nearly any process the amount of energy at 100% efficiency can be calculated. One can then compare to actual use to see how well one is doing. The last time an estimate of the efficiency of the U.S. social system was made was probably about 1972 and it was in the neighborhood of about 10%. In other words about 90% was wasted. Things have improved since then but many measurements of energy efficiency are regarded as proprietary and therefore not available. But most of it is just not measured. One does not conserve what one does not regard as of much value. This is a mistake.

TRADE

The discussion of an energy distribution system often leads people to ask how international trade would work or interface with such a system. The answer is that it would look very similar to what we have today. North America produces many things desired by the rest of the world. We would sell those things just as we do now. In the process we would collect a variety of currencies. Currencies that we do not regard as stable could be traded for those we deem to be safer. We could then use that currency to purchase what we need from other nations. Some of the money could be put aside so that our citizens could travel abroad if they desire.

TECHNOCRACY: THE DESIGN

(Continues from Lesson 22 of the *Technocracy Study Course*)

In the past there was individual ownership of small units, so that the exchange of goods on a barter or simple, hard-money basis resulted in a stable operation of the productive mechanism. Individual wealth could be, and was acquired, in recompense for diligence, thrift, and hard labor.

Those were the days of the spade, the wooden plow, homemade clothing, the ox-cart, and more recently, the horse and buggy. Today, all that has changed.

As time progressed, the population grew and the production increased. Productive units which began as small handicraft units were enlarged; new ones were established; some of the old ones dropped out. The average rate of output per establishment became so great that the total number of establishments of each given kind required for the total production, began to decrease, until today, for a large number of essential products, only a dozen or so establishments can produce at a rate equal to the consuming capacity of the entire population. In some instances, one single plant at full load operation can produce at such a rate.

While this trend has advanced further in some industries than in others, it is present in all industries, including even the most backward of them—agriculture. Since the cause for this development, namely, technological improvements, still exists in full force, there can be no doubt that this trend will continue into the future.

When, however, all products of a given kind come to be produced, as is the case today, by only a small number of productive establishments, under the ownership and control of even a smaller number of corporate bodies, and when the financial restrictions that bear upon the one bear also upon the others, the probability that all will increase or decrease production in unison with the amplitude of the oscillations approaching that from capacity output to complete shutdown, amounts almost to a certainty.

Since the amount consumed over a period of a few years is, in general, equal to or less than the amount produced in that time, these oscillations in the productive process, and the forced restrictions upon production, can only result in a restriction and curtailment of consumption on the part of the public. When this curtailment becomes so severe as to amount to privation on the part of a large proportion of the population, the controls causing the restricted production will have long since passed their period of social usefulness and will be rapidly approaching the limits of social tolerance.

In the present, as contrasted with the past, the great majority of the population is in a position of absolute dependence upon the uninterrupted operation of a technological mechanism. In the United States today, there are approximately 30 million people who live directly upon the soil, whereas almost 100 million people live in towns and cities. These latter are strictly dependent for food, water, clothing, shelter, heat, transportation and communications, upon the uninterrupted operation of the railways, the power plants, the telephone and telegraph systems, the mines, factories, farms, etc. Even the farmer of today would be in dire straits were his gasoline supply, his coal, his factory-built tools, his store-bought clothing, and even his canned foods not forthcoming.

In all preceding human history, until within the last two decades, an increase in production was accompanied by an increase in the man-hours of human labor; today, we have reached the stage where an increase of production is accompanied by a decrease in man-hours.

This is due to the facts that the motive power of present industrial equipment has become almost exclusively kilowatt-hours of extraneous energy, and that we have learned that in repetitive processes it is always possible to build a machine that will perform the given function with greater speed and precision, and at lower unit cost than it is physically possible for any human being to do.

Every time new equipment is devised, or old equipment redesigned, the newer operates in general, faster and more automatically than its predecessor, and since, as yet the accomplishments in this direction are small compared with the possibilities, it is certain that this trend will continue also into the future.

In the remote past, the rates of increase of population and production were negligibly small; in the recent past the rates of growth of both population and production have been the greatest the world has ever known; in the present and the future the rates of growth of both population and industrial production will approach zero as the leveling-off process continues.

In the past, when man-hours of human labor formed an essential part of wealth production, it was possible to effect a socially tolerable distribution of the product by means of a monetary payment on the basis of the hours of

labor expended in the productive procedure. ***[To be continued in the May issue.]***

BIG VERSUS SMALL

Imagine the following: each individual controls the means to produce whatever they need or desire, whether it be food, manufactured goods, travel or security. No one is dependent upon anyone else, nor can anyone be intimidated by anyone else. This is reminiscent of the pioneering days, where settlers lived independently by their guns and wits—"the good old days."

This is the dream of many activists, embodied by the "Small is Beautiful" philosophy espoused by E.F. Schumacher. Many environmentalists, preppers and libertarians prefer a decentralized economy. One might be a fool not to desire this dream. The problem with this dream is that individual production tends to be highly inefficient.

The small approach arguably increases personal freedom, but certainly reduces the benefits from economies of scale. Everyone owning their own factory complex would be impractical. Each person could only have a relative few tools; 40 acres and a mule, literally; they can grow food for their needs at great labor, but that is about it.

Economies of scale greatly improve industrial efficiency and our standard of living. Instead of each person having to own and operate their own billion dollar steel mill, a relatively small amount of steel mills supply the needs of an entire continent. Instead of each person having to design and produce their own billion-circuit microprocessor chips, a handful of companies make chips for everyone.

However, economies of scale can also ensnare us in the Price System and its problems. Economies of scale tend to involve centralization. Corporate mergers and consolidations are prime examples. Redundant costs are slashed, which can make good less expensive to produce, but often those costs are in the form of worker layoffs. Profits increase, but ownership has likewise become centralized and power is held in the hands of a relative few.

Defense is another issue. If there were no bigger players, then having a gun and a bible might be all the defense one needs. However, when there are global superpowers to contend with, one needs continental level defense.

Someday, it may be more feasible to have more individual production. Open source tools, personal workshops and gardens can produce homemade good to fill part of our needs. However, to maintain our high standard of living, some degree of centralization leading to economies of scale, on a sustainable basis, will be required for the foreseeable future. Technocracy's design aggressively pursues economies of scale, and providing a realistic approach to maintaining high standards of living for one and all.

TEACH SCIENCE! SOUND OF ENERGY

Anyone can become a science educator. Since Nature is elegant, much of science can be understood conceptually or with simple mathematics. This *Teach Science* section will show you how, focusing on a few science concepts and featuring a simple, inexpensive demonstration to help teach those concepts.

A good way to get started is to create your own "shoebox" laboratory. Literally, get an empty shoebox and start filling it with useful objects for science demonstrations. A binder to keep notes and a bit of shelf space for science books helps round out your lab.

Gravity is a great place to start. Gravity is a simple force. Everyone knows that objects fall. (It is easier to teach using examples that people already are familiar with.)

We will start with an easy demonstration. All you need for this one are a few pennies; ball bearings or "steel marbles" are even better (avoid glass marbles because they break).

Have your student do the following. Drop a penny or steel marble from 1 foot (1/3 meter) above a hard surface such as a table or wooden floor. Listen to the sound. Then drop the same object from 3 feet (1 meter) above the surface. The collision of the object with the surface should sound louder. Ask what this means.

Gravity near the Earth's surface can be considered a constant force. It is the same at 1 meter or 10 meters. What changes is the energy involved. When an object is raised above a surface, it stores potential energy. Relative to the surface, an object at 10 meters high will have twice as much energy as one at 5 meters high.

When you let go of the object, it starts to accelerate towards the center of the Earth. As the object speeds up, potential energy gets converted into kinetic energy (the energy of motion). So when the object collides with the surface, it makes a sound. Objects falling from a greater height collide with the surface at a higher speed, which releases more energy. That is why they sound louder.

Further Tech Science articles pay appear from time to time in the future.

(Also see Lesson 3 of the ***Technocracy Study Course***)

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