Technocracy Inc.

May-June 2014

TRENDEVENTS

Welcome to the May-June issue of TrendEvents, featuring numerous reviews of technology developments, commentary by Ron Miller, and classic material from the Technocracy Study Course.

TECHNOCRACY IN ACTION

TECHNOCRATS IN SILICON VALLEY?

Overheard from a young programmer proclaiming to classmates at a prestigious campus in Silicon Valley: "We need Technocracy. We should all become technocrats!" Whether this initiative will bear fruit remains to be seen, but Technocracy is getting heard!

NEWS

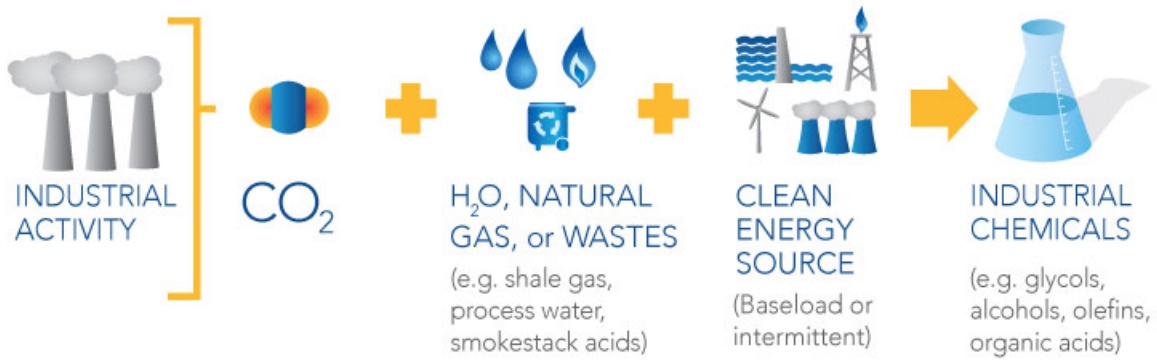
CLIMATE CHANGE

Catherine Brahic, "Lock up your carbon", *New Scientist*, 8 March 2014

Boundary Dam power plant in Canada will become the first fossil fuel plant to remove and pump a large amount of the carbon dioxide it produces underground. The International Energy Agency says that to have a 50 percent chance of avoiding a two degree rise in global warming, which is too dangerous to adapt to, the energy sector can only emit 884 gigatonnes of carbon

dioxide between 2013 and 2050. Burning proven reserves coal, oil and gas would release 2860 Gt. So we must leave two thirds in the ground. The question to be answered is there enough room underground to store all that gas?

Liquid Light of Monmouth Junction, New Jersey, showed off its prototype carbon dioxide converter at the ARPA-E Energy Innovation Summit in Washington DC last week. About the length and width of a coffee table, and a few inches thick, the module is a layer cake of steel and plastic. Inside it are catalysts that can produce more than 60 carbon-based chemicals, from just carbon dioxide and electricity. By linking many of these devices together, a chemical plant could convert carbon dioxide into hundreds of thousands of tons of products in a year, says co-founder Kyle Teamey.



Liquid Light waste utilization process

COMMENT: Scientists have known about the dangers of carbon dioxide for decades. There also seems little doubt that the technological capacity exists to solve the problem. It presents an interesting problem for politicians. If the problem is solved correctly the end result would be that nothing unusual would happen. There would be no ribbon cutting ceremony. No grand monuments to be pointed out. There is a good chance that it would take up a substantial portion of a nations GNP.

It must be noted that, when it was discovered that propellants in spray cans were destroying Earth's ozone layer, humanity decided against committing suicide and outlawed them. The ozone layer protects Earth from ultraviolet radiation from the sun that would, left unchecked, extinguish all life. While the ozone layer is still rebuilding the ban was effective. But that involved only one chemical for which replacements could be rapidly devised. Carbon dioxide is produced every time something is burned containing carbon, which is virtually everything combustible.

HEALTH JOLT

Linda Geddes, "The Healing Spark" *New Scientist*; February 22, 2014

Out of desperation Ostokovich suffering from rheumatoid arthritis agreed to an experimental technology requiring an implant of a small computer in the back of his neck that would instruct his immune cells to stop what they were doing. It worked so well that he has returned to a normal life.

It now seems that the electrical language of the nerves might be spoken more widely than previously thought, coordinating the actions of our organs, glands and cells. It may even be possible to coax the body into healing itself. Autoimmune diseases, asthma, diabetes and gastric conditions are just a few of the disorders that appear amenable to electrical intervention. There are even hints that it could be used as a radical way of treating cancer.

Dr. Kevin Tracey of the Feinstein Institute for Medical Research stumbled across the effect by being a very acute observer of cellular behavior in the late 1990's. Recently 81 people admitted to emergency departments during an asthma attack who didn't respond to standard drugs within an hour had electrical stimulation with Electrocore's implanted electrode which led to significant improvement in their lung function.

A great deal of research is now underway in many locations. The goal is to have rice sized implants that sit on the peripheral nerves and record the complexity of the electrical language that flows through them, detect when something is wrong then fix it.

GENE THERAPY

Ricki Lewis, "Gene Therapy's Second Act", *Scientific American*, March 2014;

Colin Barras, "Right on Target", *New Scientist*, January 25, 2014

The difficulty with gene therapy appears to mostly be a problem with the viruses used as delivery vehicles for replacement genes. It also appears that researchers got a bit ahead of themselves in their zeal to put it to work. Now new delivery viruses have been developed that promise better results.

Sight has been restored in about 40 people with a hereditary form of blindness. Doctors have seen unprecedented results among another 120-plus patients with various cancers of the blood–several of whom remain free of malignancy three years after treatment. Although gene therapy is not available in hospitals and clinics, that is likely to change in the next decade.

The first new delivery system, adeno-associated virus (AAV), does not make people sick (although most of us have been infected by it at one time or another). Because it is so common, it is unlikely to cause extreme immune reactions. This virus has another feature that should help minimize side effects: it is available in several varieties that favor specific types of

cells or tissues. For example, AAV2 works well in the eye, whereas AAV8 prefers the liver, and AAV9 slips into heart and brain tissue. Researchers can choose the best AAV for a specific body part, decreasing the number of individual viruses that need to be injected and thus minimizing the chances of an overwhelming immune response or other unwanted reaction. Plus, AAV deposits its genetic payload outside the chromosomes, so it cannot accidentally cause cancer by interfering with oncogenes. Current studies are underway evaluating effectiveness for several brain diseases, including hemophilia, Parkinson's, Alzheimer's, muscular dystrophy, heart failure and blindness. New techniques using RNA may be even more precise but that remains to be seen.

China was the first country to approve a gene treatment, in 2004, for head and neck cancer. In 2012 Europe approved a gene therapy-based drug called Glybera to treat familial lipoprotein lipase deficiency. Much work remains to be done but things look quite promising.

DESERT BACTERIA

Hal Hodson, "Spray bacteria on the desert to halt its spread", *New Scientist*, Jan. 4, 2014

Bacteria (U.S. Department of Energy)

In northern China, the eastern edge of the Qubqi desert is a shifting wasteland of sand dunes. Most of the land is dusty and barren, but bacteria are giving some of it a new lease on life. If left unchecked, creeping sands can slowly engulf vital infrastructure such as roads and railways. Farmland and even major cities can be swamped by dust storms that began in the desert.

Planting hardy grasses helps keep sand in place, but the wind can still whip away particles between the grasses. So Chunxiang Hu of the Chinese Academy of Science's Institute of Hydrobiology in Wuhan has developed and alternative approach. She coats planed dunes with a mixture of photosynthesizing cyanobacteria that can thrive in the semi-arid environment.

Grown in nearby ponds, the cyanobacteria are trucked into the desert every few days and sprayed over the dunes, where they form sticky filaments that hold soil particles in place and prevent them from being blown away. Cyanobacteria get their energy from sunlight via photosynthesis, and as part of the chemical reactions involved, they absorb carbon from the atmosphere and provide the organic matter the soil needs to be productive.

Hu's long running-trial shows that after eight years, dunes treated with Cyanobacteria developed a biological crust nearly 1 centimeter thick when on the shady side of dunes. On the

sunny side, the crust is about half as thick. The topsoil improved where the crust developed, spurring plant growth.

Hu says the Cyanobacteria are now being used to shore up the verges of roads and railways in northern China as well as the margins of oases and farmland. Her team plans to seed 133 square kilometers over the next five years (*Environmental Science and Technology*, doi.org/qn9).

Desertification is also a problem in the US, says Mathew Bowker, a soil ecologist at Northern Arizona University in Flagstaff, but the issue isn't yet big enough to prompt the country to pour money into projects like Hu's.

BACTERIA IN US

John Cryan and Timothy Dinan, "A Light on psychobiotics", *New Scientist*, 25 January 2014

It is something of a recent discovery that a normal human body contains more bacteria than cells. Many of those bacteria produce things that we cannot produce for ourselves. In combined actual weight they are approximately equal to the weight of the brain. What many of them do is still being studied but it is known that they have a profound influence on us in many ways. Bacteria are usually studied by growing them in laboratory dishes then analyzing how they react with the environment. It now seems that many cannot be studied in this way. Many of the bacteria in the human digestive system cannot live outside the human body. The science involved in the study of the phenomenon is referred to as psychobiotics. These bacteria have a large impact on our personalities as well as the proper functioning of our physical bodies.

Persons with a variety of both mental and physical disturbances have been cured by a bacteria implant from a healthy person. Although the exact reasons why it works are only dimly understood, this sort of treatment is becoming more common.

SOCIAL CHANGE

Michael Shermer, "Heavens on Earth", *Scientific American*, February 2014

What is the best way to effect social change? It depends on whether the change is brought about through violence or resistance. University of Denver political scientist Erica Chenoweth and her colleague Maria Stephan compared violent and nonviolent revolutions and reforms since 1900. They found that "from 1900 to 2006, nonviolent campaigns worldwide were twice as likely to succeed outright as violent insurgencies." And: "This trend has been increasing over time, so that in the last 50 years nonviolent campaigns are becoming increasingly

successful and common, whereas violent insurgencies are becoming increasingly rare and unsuccessful." Only a small percentage of a population is necessary to bring about change: "No single campaigns failed after they'd achieved the active and sustained participation of just 3.5 percent of the population." And if they surpassed the 3.5 percent threshold, all were nonviolent and "often much more inclusive and representative in terms of gender, age, race, political party, class, and the urban-rural distinction." It's a faster track to the 3.5 percent magic number when you are more inclusive and participation barriers are low.Plus, nonviolent resistance does not require expensive guns and weapons.

COMMENT: It seems that others can now prove what Technocracy asserted many years ago when it declared that it would never ask citizens to use either bullets or ballots to affect social change.

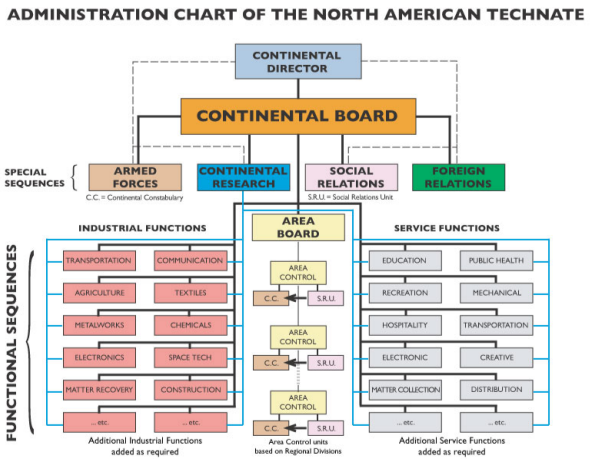
TECHNOCRACY: THE DESIGN

(From Chapter 4 of the *Technocracy Study Course*)

Invariably the old idealogies of the past fade out of use and new ones, conforming more nearly to the new physical factors, take their places.

The conflict that we are now in the midst of is precisely of this sort—a conflict between physical reality and the antiquated ideology of a bygone age. In the case of the automobile, the ultimate solution came by abandoning the attempts of suppression and by devising control measures to fit the physical requirements of the thing being installed. Since the horse and buggy was physically different from the automobile, it is obvious that traffic measures and road design adequate for the former would be inadequate for the latter, and no solution was possible that was not formulated in recognition of this fact.

So today, with the operation of our technological mechanism, the control measures that must and will be adopted are those that most nearly conform to the technological operating requirements of that mechanism.



These requirements can be known only by those who are intimately familiar with the technical details of that mechanism—our technically trained personnel; though prior to there being a general recognition of this fact, we may expect to witness performances on the part of our economists, lawyers, politicians, and businessmen that will parallel the performances of all the witch doctors of preceding ages.

It was a recognition of the fact that we are confronted with a technological problem that requires a technological solution that prompted the scientists and technologists who later organized Technocracy Inc. to begin the study of the problem and its solution as early as the year 1919.

Out of that study a technological design expressly for the purpose of meeting this technological problem has been produced. An outline of some of its principal features is presented in what follows.

PERSONNEL

First, required resources must be available; second, the industrial equipment must exist; and third, the population must be so trained and organized as to maintain the continuance of the operation within the limits specified.

This brings us to the question of the design of the social organization. To begin with let us recall that the population falls into three social classes as regards their ability to do service. The first is composed of those who, because of their young age, have not yet begun their service. This includes the period from infancy up through all stages of formal education. After this period comes the second, during which the individual performs a social service at some function or other. Finally, the last period is that of retirement, which extends from the end of the period of service until the death of the individual. These three periods embrace the activities of all normal individuals. There is always another smaller group that is not performing any useful social service at a time when it normally would be because of ill health or some other form of incapacitation. Therefore, the social organization must embrace all those of both sexes who are exempt from the performance of some useful function.

We emphasize the fact that these groups of a population are not something new; they exist in any society. We have deliberately left out certain groups that ordinarily exist: those who perform no useful social service though able to do so and those whose services are definitely socially objectionable. *It is the group that is giving service at some socially useful function that constitutes the personnel of our operating organization.*

What must this organization do?

It must operate the entire physical equipment of the North American Continent. It must perform all service functions, such as public health service, education, recreation, etc., for the population of this entire area. In other words, it has to operate and perform every functional job that exists.

What other properties must this organization have?

It must see to it that the right persons are in the right place. This depends both upon the technical qualification of the individual as compared with the corresponding requirements of the job and also upon the biological factors of the human animal discussed previously. It must see to it that these persons must be the type who, in an uncontrolled situation, would spontaneously assume that position among their coworkers. There must be as near as possible no inversion of the natural "peck-rights" among the workers.

It must provide ample leeway for the expression of individual initiative on the part of those gifted with such modes of behavior, so long as such expression of individual initiative does not occur in modes of action that are themselves socially objectionable. It must be

dynamic rather than static. The operations themselves must be allowed to undergo a normal progressive evolution, including an evolution in the industrial equipment, and the organizational structure must likewise evolve to whatever extent becomes necessary.

The general form of the organization is dictated by the functions that must be performed. Thus, there is a direct functional relationship between the conductor and the engineer on a railway train, whereas there is no functional relationship whatever between the members-at-large of a political or financial organization. The major divisions of this organization, therefore, would be automatically determined by the major divisions of the functions that must be performed. The general function of communications, for instance; mail, telegraph, telephone, television and radio automatically constitutes a functional unit.

OPERATING EXAMPLE

Lest the above specifications of a functional organization tend to frighten one, let us look at some of the functional organizations that exist already. One of the largest single functional organizations, before deregulation took place, was that of the Bell Telephone system. What we refer to here in particular is that branch of the Bell system personnel that designed, constructed, installed, maintained, and operated the physical equipment of the system. The financial superstructure-- the stock and bond holders, the board of directors, the president of the company and other similar officials whose duties were chiefly financial—was distinctly not a part of this functional organization, and technically their services could readily have been dispensed with. This functional organization did comprise upwards of 800,000 people. It is of interest to review what its performance was and something of its internal structure, since relationships found in organizations of this immensity will undoubtedly be found in the greater organization whose design we are anticipating.

What were the characteristics of this telephone organization?

(1) It maintained in continuous operation what was probably the most complex interconnected array of physical apparatus in existence.

(2) It was dynamic in that it continually changed the apparatus with which it had to deal and remolded the organization accordingly. Here we had a single organization that came into existence as a mere handful of personnel in the 1880s. Starting initially with no equipment, it designed, built, and installed equipment and replaced this with still newer equipment until it spanned most of the North American Continent as a single network, and maintained interconnecting long-distance service to almost all parts of the world. All this was done with rarely an interruption of 24-hour-per-day service to the individual subscriber. In the meantime, the organization had grown from zero to 800,000 people.

(3) That the right people must have been placed in the right job is sufficiently attested to by the fact that the system worked. The fact that an individual on any one telephone in a given city could call any other telephone in that city at any hour of the day or night -- and in all kinds of weather -- with only a few seconds of delay, or that a long-distance call could be completed in a similar manner across the entire Continent in a mere matter of a minute or two, is ample evidence that the individuals in whatever capacity in the

functional operation of the telephone system must have been competent to handle their jobs.

Thus, we see that this functional organization, comprising 800,000 people, satisfied a number of the basic requirements of the organization whose design we contemplate. It is worthwhile, therefore, to examine somewhat the internal structure of this organization.

What was the basis on which it was decided that a telephone circuit would be according to one wiring diagram and not according to another?

The fitting of the person to the job was not done by election or by any of the familiar democratic or political procedures. Employees got their jobs by the nomination of their peers and through appointment by their superiors and were promoted or demoted by the same process. The people making the appointment were invariably those who were familiar both with the technical requirements of the job and with the technical qualifications of the person. An error of appointment invariably showed up in the inability of the appointee to hold the job, but such errors could promptly be corrected by demotion or transfer until one found a job that one could perform. The appointive system pyramided on up through the ranks of all functional subdivisions of the system, and even the chief engineers and the operating vice-presidents attained and held their positions also by appointment. It is here that the functional organization came to the apex of its pyramid and ended where the financial superstructure began. At this point also the criteria of performance suddenly changed. In the functional sequence the criterion of performance was how well the telephone system worked. In the financial superstructure the criterion of performance was the amount of dividends paid to the stockholders. Even the personnel of this latter were not the free agents they were commonly presumed to be because if the dividend rate was not maintained, there was a high probability that even their jobs would be terminated.

The other question that remains to be considered is that of the method of arriving at technical decisions regarding matters pertaining to the physical equipment. If the telephone service is to be maintained, there is an infinitely wider variety of things that cannot be done than there is of things that can be done. Electrical circuits are no respecters of persons, and if a circuit is **dictated** that is contrary to Ohm's Law, or any of a dozen other fixed electrical relationships, it will not work even if the chief engineer himself requests it. It might with some justice be said that the greater part of one's technical training in such positions consists in knowing what not to do, or at least what not to try. As long as telephone service is the final criterion, decisions as to which circuits shall be given preference are made, not by chief engineers, but **by results of experiment.** Through experiment the circuit that gives the best results will be used. A large part of technical knowledge consists in knowing which of two things will work the better on the basis of experiments already performed. In case such knowledge does not exist already, it is a problem for the research staff and not for the chief executive. The research staff discovers which mode of procedure is best, tries it out on a small scale until it is perfected and designs similar equipment for large-scale use. The chief executive sees that these designs are executed.

Such are some of the basic properties of any competent functional organization. *It had no political precedents. It was neither democratic, autocratic nor dictatorial.* It was determined by

the requirements of the job that had to be done and, judging from the number of human beings performing quietly within such an organization, it must also have been in accord with the biological nature of the human animal.

NOTE: Before deregulation, the Bell Telephone System gave excellent and efficient service—about the best we could expect of a Price System operation. We didn't own our phone; we rented it. Since deregulation, we have had confusion about which company operates what. This is what happens when an attempt is made to manipulate the functioning of technology so that it spreads the profit among more investors.

Technocracy Motorcade

This is an official publication of:
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