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Science, Civilization and Society

CPES 2220: A course of 35 lectures, first given at the Flinders University of South Australia during the second half of 2004.

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The course will be given for the third time in August - October 2006, which will lead to minor changes and some major amendments as time goes on. In its present form the material can be considered version 2.0.

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Lecture 35

Science, civilization and society in the 21st century. (Refers to NFTC studies – p. 5)

Introduction

A lecture series on science, civilization and society is a voyage through 5000 years of human history. By following the steps to the mapping of the human genome the last lecture already reached into the 21st century. Now is the time to review the entire development, draw some conclusions and look forward.

One clear outcome from any study of science and civilization is the realization how closely the two have become linked over time. Our civilization today could not have been built without the achievements of science, and science could not have achieved what it did without being driven by the needs of civilization and being supported by its infrastructure.

The public perception of the role of science varied greatly over time. As an activity controlled by the ruling classes science has always found a mixed reception with the common people. Its potential use for the improvement of the human condition has always been recognized, particularly in medicine and surgery and in technological applications. But common people also experienced science in the form of weapons of war and machinery to extract more labour out of men, women and children and rarely had access to the medical knowledge that accumulated in the households of the nobles. It cannot come as a surprise that ordinary people mostly saw science as something alien to the daily lives at best and potentially threatening at worst.

Differences of public perception emerge when the intellectual climate of different periods in history is taken into account. During the 17th and 18th centuries science was at the centre of social talk in every household of Europe and the topic of debating circles in the houses of the upper class. (Lecture 20) After the industrial revolution this developed into a blind trust that science and technology could provide the means to cure all problems of society.

The belief in science as the new saviour survived into the early decades of the 20th century. It was **particularly strong** in the Soviet Union, which made support for science a cornerstone of its development. During the second half of the 20th century this glorified view of science gradually gave way to growing scepticism and negative assessment of the contributions of science to society.

...The advent of capitalism has set new conditions for society. Its driving force is profit maximization. It is true that profit can only be made with products or services that satisfy public demand. Creating artificial demand is possible to some extent, as is evidenced by the fashion industry, designer labels, ring tones for mobile phones etc.; but the basis of every economy including capitalism is and remains the requirement to provide food, clothing, health and shelter.

Capitalism meets these requirements but is not driven by them. It only provides food if there is profit to be made in the process. This is the reason why poverty has taken on a new dimension under capitalism. In all previous social systems poverty was inflicted on people during periods of bad harvests and other natural disasters but did not result from the system itself. Under capitalism science has provided the means to feed every human being on Earth, and industrial countries have introduced elaborate administrative systems to dispose of agricultural produce that cannot be sold profitably. Hunger and poverty are no longer inflicted on people because people find themselves helpless in the face of natural disasters but are the outcome of the laws of society.

The laws of society are objective laws that cannot be broken by subjective decisions of individuals. Davy could refuse to patent his invention; he could not stop capitalists to take advantage of it. In the end mine safety was greatly increased, the miners could expect a longer life under the same miserable living conditions and the mine owners higher profits.

The introduction of maximum profit as the driving force of the economy is the reason for the tremendous acceleration of scientific progress since the Enlightenment. Thousands of new chemical compounds that do not exist naturally have been introduced during the last fifty years, with only very rudimentary knowledge of their effects on humans, animals, plants and the inanimate environment. Materials derived from oil (plastics, synthetic fibres etc) have replaced traditional materials that were well understood and proven for centuries. Some new compounds such as **DDT** and **CFC** had to be banned, others, such as toxic **antifouling paints**, are still in use.

Throughout this series of lectures we have said that science develops where there is a need for it. Under capitalism this need springs from the law of profit maximization as the driving force of the economy. Society has a need for shirts; it does not develop the need to replace cotton by synthetic fibre. But profits are higher when cotton is replaced by synthetic fibre, so science produces a new chemical compound, and industry uses it, without much regard for whatever the environmental and social consequences might be.

...The subservience of science to the law of profit maximization raises the question whether the explosion of scientific research observed during the last two centuries has to continue if the human species is to survive.

...The economic conflict between the imperialist powers and the poor nations has created a new type of science that I call partisan science, wilfully deformed science designed to counter criticism of the activities of the imperialist powers. Partisan science should not be confused with solicited science, given for example to tobacco companies to "prove" that smoking does not pose a health hazard.

Partisan science relates to solicited science in the same way that pure science relates to applied science: It serves the same purpose as its applied partner but operates on an apparently neutral level disconnected from its beneficiaries. It arises when scientific facts show that the Earth will suffer irreparable damage if the ruling class continues to operate as it does.

One area where partisan science has gained a position of influence is climate research.

...Unlike solicited science, partisan science does not falsify observations or produce bogus experimental results. It combines correct scientific findings with unethical argumentation to promote wrong conclusions.

...The use of established scientific facts allows partisan scientists to achieve respectability.

... It is not the observational evidence that makes Lomborg a partisan scientist, it is the ethical dimension of his science. Ethical standards are not arbitrary choices of societies, they are part of the human character and were formed in the process of evolution. (Lecture 1) Standards of "good" and "bad" exist independent of religion and ideology, and it is impossible for individuals to claim that they are beyond ethical judgement.

The World Economic Forum and the magazine *Business Week* of the USA are known for their unrestrained support for global capitalism. The Forum named Lomborg a "Global Leader of Tomorrow", *Business Week* voted him one of the "50 Stars of Europe." (Dayton, 2003) The Competitive Enterprise Institute awarded him its Julian I. Simon Memorial Award. The institutions bestowed these honours on Lomborg because his partisan science supports the practices of the large corporations in their quest for world domination. Serious ethical scientific analysis would include a study how corporations use patents to maintain their stranglehold on the Third World, attempt to impose conditions on environmental law making and much more.

The success of partisan science is only possible because modern science has long left the area of everyday experience. Ordinary people have no way to judge the truth of statements on climate change, and this is true as well for scientists of unrelated disciplines. The public has to take scientific assessments of climate change on trust. Science then becomes a matter of faith, and the philosophical position of postmodernism that there are alternative versions of science turns into reality. Scientists in the USA already complain about the emergence of two versions of science, one accepted by the government and corporations, the other pursued and taught at universities. There is no doubt that partisan science has gained control of sections of the US government.

...Towards a better future?

I chose climate research as an example of the rise of partisan science because it is an area that my training as an oceanographer allows me to understand. Without doubt **partisan science will develop in other areas as well, if it does not exist already. It will arise wherever the aims of corporations and imperial powers come into conflict with the precautionary principle.**

One such area will be genetic engineering.

...The issue is not genetic engineering as such but who decides over its use. **The principle of profit maximization will inevitably lead to pressure to disregard the precautionary principle** and give rise to the genetical engineering branch of partisan science. First indications also show that it will not necessarily lead to the best use of useful products by society but increase the gulf between rich and poor nations.

...I conclude this lecture series with a few thoughts about better alternatives for the future of humanity. It is not so long ago that international corporations moved to get the United Nations to agree to international legislation that would override the right of sovereign nations to define their own law. The proposal was made in the interest of facilitating free trade, which is hindered if the degree of legislative protection of the environment, for example, varies from country to country. **The corporations wanted to impose uniform (and preferable minimal) environmental legislation on the world.**

The attempt was not successful, but the intention remains. It is an indication of what we can expect if the principle of profit maximization remains the driving force of society. And as every economist will tell us, capitalism requires economic growth, or it will create unemployment and therefore social unrest. The question is whether there is an alternative to economic growth.

...When a country in which most land is owned by the previous colonial masters repossesses its land and distributes it to the people for subsistence farming it loses export income from cash crop farming; its GNP will suffer severely, but its people are much better off than before.

Even if one accepts GNP as a measure of social progress it is clear that perpetual economic growth is impossible. There is a limit to what the Earth can deliver. Arguments such as "Even the total weight of the Earth is not a theoretical limit to the amount of copper that might be available to earthlings in the future. Only the total weight of the universe would be such a theoretical limit because copper can be made from other metals" (proffered by the

Professor of Business Administration Julian Simon and reported by the equally questionable Ehrlich, 2003) are simply not worth serious consideration.

The concept of a sustainable economy has found wide acceptance in the area of power generation and some areas of raw materials, particularly the forestry industry. There is no reason why it should not be extended to all other economic activities. This would eventually lead to a zero-growth model of the economy, where the level of economic activity would be determined by the needs of people and therefore proportional to the size of the population.

Supporters of capitalism point towards the collapse of the Soviet Union in 1991 as proof that there is no alternative to capitalism. They **ignore that socialism turned the Soviet Union from a backward feudal state into a superpower in a time span of less than 40 years.** In the USA the rise to economic domination began with the end of the Civil War in 1865 and was not completed before Roosevelt authorized the Manhattan Project in 1940.

...One benefit that one derives from the study of history is a wider perspective on contemporary developments. It took 220 years (from the Civil Wars of England in 1642 - 1651 to the establishment of the Third Republic in France in 1871) to establish modern democracy as the political form of capitalism in the leading industrialized countries, even longer if the history of the republic in Germany is taken into account. 1871 also marked the brief appearance of the [Commune de Paris](#), the first attempt to establish a socialist state. **It may well take another 220 years before capitalism is replaced by a superior economic system.**

There can be no doubt that the beginning of the 21st century is a period of regression. Most countries that liberated themselves from colonial rule in the national revolution established their own capitalist economy. Their national bourgeoisie abandoned the anti-colonial alliance with the common people and joined the international corporations in the exploitation of the population. The struggle between the imperialist powers and the exploited and impoverished nations is fought without clear leadership and concept and has degenerated into random attacks on targets seen as incarnations of imperialism. The powers under attack declare a "war on terror" to defend their position.

It is clear that the actions of the "terrorists" are a response to the current economic world order. It is also clear that their strategy will not lead to a better society. Such a society cannot be reached by return to social orders of the past, it requires the transition to a new world order... It will not be the society of [John Locke](#) nor the society of [Adam Smith](#) and may show only the slightest resemblance to the society of [Karl Marx](#). But it will no longer be based on indefinite economic growth for the maximization of profit.

What will be the role of science in such a society? It will be less directed towards expanding exploitation of resources and more towards supporting the Earth and the people that inhabit it. **Because the use of new inventions will be based on the rigorous application of the precautionary principle, much more scientific energy will be spent on the evaluation of new ideas than on the search for new ideas. The rate of innovation will slow down, and the current explosion of scientific research will stabilize at a level that matches new discoveries and developments with the ability of science to evaluate their consequences.** It will not be Pavlov's vision of "The omnipotent scientific method will deliver man from his present gloom". Let us hope that it will at least be science in the service of humanity.

...[Postscriptum](#)

When I prepared this course material I had not been aware of developments that already point in the direction indicated in the last sentences. **In February 2001 a White Paper on a "Strategy for a future Chemicals Policy" issued by the Commission of the European Communities suggested the introduction of legislation that represents a shift from unrestricted innovation towards the precautionary principle.** The legislation, originally proposed as "Registration, Evaluation, Authorisation and Restriction of Chemicals" and now known under the acronym REACH (Registration, Evaluation and Authorisation

of Chemicals), aims at a comprehensive system under which every industrially produced chemical has to be shown to be environmentally harmless before it can be marketed.

...The fact remains that REACH is the first attempt to define the role of science in the area of chemical innovation on the basis of the precautionary principle. **The National Foreign Trade Council of the USA does not share this vision of the future role of science and ran a [virulent campaign](#) against the European Commission. It is particularly opposed to the clause that under REACH regulations users of chemicals will have to demonstrate the environmental harmlessness of their use: Chemicals produced in the USA that do not conform to REACH requirements will then be banned from sale on the European market.**

It is too early to tell how effective REACH can be under the current political world system. It is a first step to redirect the focus of science from unlimited innovation to protection of the health of our planet. The future will show how long it will take to reach that aim.

...[Virulent Campaign](#)

The National Foreign Trade Council of the USA and REACH

The National Foreign Trade Council (NFTC) was founded in 1914 and today represents over 400 member companies.

In a press release of 4 September 2003 the NFTC, which describes itself as "a leading business organization advocating an open, rules-based global trading system", warned the world that the European Union member states "attempt to globally employ the precautionary principle" and that this "jeopardizes international trade and development." **The press release speaks for itself:**

Washington, DC – Scattered over numerous forums and obfuscated by public product safety anxiety, a growing attempt to limit trade through the use of technical barriers has largely been overlooked. However, a white paper authored by the National Foreign Trade Council and published by the Washington Legal Foundation presents compelling evidence of a deliberate strategy to protect ailing EU industries. The paper, *EU Regulations, Standardization and the Precautionary Principle: The Art of Crafting a Three-Dimensional Trade Strategy That Ignores Sound Science*, offers powerful evidence of the EU's attempt to define and employ the precautionary principle globally.

"It's easy to overlook the long term implications of a negotiation over a specific trade initiative or industry sector. It would be naive, however, to assume a broader strategy does not exist," said NFTC President Bill Reinsch. "This paper details the EU's attempts to elevate the status of the precautionary principle from a limited WTO exception to a norm of international law."

A paper released by NFTC in May, *Looking Behind the Curtain*, presented numerous examples of the EU's use of precaution to block trade in a wide variety of products ranging from beef to computers. This most recent work goes a step further and clearly shows how the EU has sought to inject the precautionary principle within:

- The WTO system through creative interpretation of the SPS and TBT Agreements and through obligations assumed under multilateral environmental agreements;
- International standards through participation in the standards development process;
- Bilateral and regional free trade and aid agreements.

Reinsch urged U.S. industries and the various agencies engaged in advocating for free trade to come together in their opposition to these trade-restricting practices. "If the role of objective science in the WTO agreements is to be preserved, the U.S. must adopt a long-term view as it responds to the EU's complex challenge." He went on to caution against being lulled into a false sense of security by the EU's apparent slowness in achieving its goal of establishing precaution in international law. "Changing international law takes time, but that doesn't mean there isn't a great deal at risk now. This is more than a disagreement between two large economies. The loss of sound science as the benchmark for international trade regulation will have tremendous economic and social consequences for developing countries as well."

Reference

Mora, S. (2003) *NFTC and Washington Legal Foundation Paper*
<http://www.nftc.org/newsflash/newsflash.asp?Mode=View&articleid=1649&Category=All>