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What happens when the oil runs out?

When the fundamental cornerstones of a society are being threatened, it is easiest to face the threat with silence and denial. The picture of our future is continually growing clearer. It is an extremely serious picture and yet every debate and discussion concerning it seems to be taboo.

Our global production of energy is now facing an almost unsolvable crisis. One basic requirement for economic growth is that an ever-greater amount of energy, primarily from oil and gas, is available. We need it for the increasing numbers of cars, juggernauts, charter trips, ships and as raw products for our chemical industry. Virtually all human activities and social behaviour in our industrial society require oil – especially for the production and supply of food.

In recent years, a number of leading international petroleum geologists and oil prospectors have been explicit in their message to the world. The global extraction of oil will soon start to decline. And will thereafter never increase again.

A major conference was held in Copenhagen on 10th December 2003, organised by the Danish Board of Technology (Teknologirådet) and the Society of Danish Engineers (IDA), on the impending turning point for industrial society. Yet this critical meeting and its extremely important subject were given no coverage by the media. And that perhaps is most serious of all, since it means that we are being denied the possibility of preparing ourselves for the straits that are to come.

It was recently broadcast that a 'major' new find had been discovered in the North Sea. This find will be sufficient to meet world consumption needs for a total of about five days (*The Guardian* 2 December 2003).

The oil that is pumped up today comes from hundreds of large oil fields around the world, the largest of which were discovered more than twenty years ago. No new fields of any magnitude have been discovered in recent years. The ever more sophisticated technical equipment has only been able to indicate where there isn't any oil. According to petroleum geologist Colin Campbell, and many others with him, the amount of oil we consume annually is far greater than the new amounts of oil that the geologists are finding today. The troop of oil prospectors is disbanding and nowadays no new oil refineries are being built – while at the same time, we are seeing a worldwide growth in transport needs and the total number of vehicles, particularly in China and India.

The geologist M. King Hubbert pointed out back in the 1950s that every oil find and its extraction run an inevitable course. Once extraction has begun, production rises to a peak and then declines. This course of events can only be affected to a small extent by various technical measures. The occurrence of this peak is of vital importance to the future of industrial society. Once an oil find has peaked or topped, there is no turning back and production gradually declines. A find usually peaks when approximately half of the oil has been pumped up.

Industrial society's total resources of liquid fuel have now reached this critical point, according to a long list of experts that includes Colin Campbell, Jean Laherre, L. F. Ivanhoe, W. Youngquist, K. S. Deffeyes and Kjell Aleklett. Campbell's statistics indicate that total global production of crude oil has already peaked, if we except the Middle East. North Sea oil extraction is now rapidly declining and extraction in the USA began falling

back in the 1970s. But for the time being, the Middle East is supplying the world with the oil that is needed. Saudi Arabia, Kuwait, Iraq and the United Arab Emirates are called 'swing producers' as they still have this capacity. Thus with every day that passes, the geopolitical importance of the Middle East grows and it is this region that will also form our geopolitical centre, probably for the rest of this century. It can hardly have escaped anyone's attention that this region already has this not very enviable role.
Oil experts calculate that current production rates can only be maintained for a few more years. The decline may already start in 2004, as geophysicist Kenneth Deffeyes says. Others believe it will begin in 2008 or 2012 at the latest. These types of predictions and opinions are full of uncertainties, but it is best, without doubt, to prepare ourselves now for the approaching storm and be pleasantly surprised if we are given a few more years' respite. The oil shortage will make itself known through sudden explosions in the price of oil and petroleum. Prices may very well rise abruptly by between 5 and 10 times, perhaps more.

Those who don't know a great deal about oil extraction, its everyday workings and problems, may have hazy dreams about unconventional oil finds that can replace the declining amounts of conventional oil, for example oil sands in Canada, or oil that is difficult to extract from Polar and deep-sea regions. The greatest problem with these finds is not a technical problem. It is the simple fact that tremendous amounts of energy are required to get hold of this form of energy. In other words, the net yield of energy may well be negligible. Almost all the energy that would be extracted would be used for the actual process of extraction. It is the same too for many alternative fuels, such as methanol, ethanol and rapeseed oil. Professor David Pimentel at Cornell University has proved that 70 per cent more energy is used in manufacturing ethanol than what is actually produced. As long as we have inexpensive, normal oil/petrol with which to manufacture and power our chainsaws, tractors, lorries, fertilisers, pesticides, irrigation facilities, processing plants and so on, we can live with the illusion that there is a future here.

John Attarian, an economist at the University of Michigan, points out another limitation in this context – the shortage of biological raw materials. It's one thing that a few cars are already using rapeseed oil or ethanol as fuel these days, but there aren't the forests nor land, not by a long way, to supply the whole of our rolling transportation needs with alternative fuels if, at the same time, we want to be producing foods, timber and paper pulp. In the same way, all the talk about hydrogen gas and fuel cells is illusory because hydrogen gas has to be produced using some other source of energy.
The real crux of the problem with our dependence on oil is the almost astronomical extent of this dependence. The world's total consumption/production of oil is currently about 200 tonnes per second. You could say that is one third of the largest Swedish river, the Göta Älv river, or an endless motorcade of 20 tank lorries driving abreast at a speed of 40 kilometres per hour round the clock. It's not just a matter of replacing the momentary flow of the Göta River – we need to build up a long-term extraction of energy that is the equivalent of the entire length of the Göta River along with Sweden's largest lake, Lake Vänern, and its tributaries. It is a question of replacing gigantic amounts of energy and there is no known source of energy that we can use.

We cannot drive cars and boats or fly planes using electricity produced by wind or nuclear power. The whole of our transportation system is, in effect, dependent on liquid fuel. Converting all 500 million cars on this earth to run on some other form of fuel, for instance electricity from batteries, brings us up against tremendous problems, not least having to

produce the material to make the batteries. The world economy and industrial production – the manufacture of alternative engines and batteries, as well as wind power stations etc. – will suffer serious damage when the oil shortage has taken its stranglehold on our civilisation.
John Attarian, Colin Campbell and other experts imply that there actually is nothing else that we can use to replace oil at short notice. We know that synthetic oil can be produced from coal but, for all that, its significance will be little. Instead, it is believed that all of us will be forced to get used to a dwindling production of liquid fuel. This will lead to huge changes – changes that are considered unimaginable by most of us today.

It should be mentioned that there are economists who, for fear of panic in the economy and amongst investors, categorically deny the fact that oil extraction will soon be on the decline. They have no understanding of the geology of oil and seem to believe that market forces and financial resources can in some miraculous way charm unlimited amounts of new oil from the bowels of the earth. In his work *The coming end of cheap oil* John Attarian convincingly proves that this is unfounded wishful thinking. Oil can be converted into money, but not money into oil.
Perhaps the most serious and thought-provoking effects of the approaching oil crisis will be noticeable on the global production of food. Modern agriculture is based on oil. It has been estimated that, in the course of one year, each American person eats food that has been produced using about one and a half tonnes of oil. Since our earth's reserves, with regard to the production of food, are located to a great extent in the USA and Canada, the shortage of oil will be swiftly reflected in a global inability to feed the mouths of six billion people.
Dale Allen Pfeiffer, a geologist, has estimated that oil, through mechanisation methods, artificial fertilisers, irrigation, etc., has meant that yields of food the 'artificial way' have tripled. A decline in oil production could therefore lead to major tragedy for our global population, with numbers possibly decreasing to two billion.
These figures are obviously very uncertain. If, for example, the wealthy population of the world could go without animal products and become vegetarians, large areas of land might then become available for the production of grain. This is one example of the type of moral issues that will soon be brought to a head and really do need to be discussed immediately.

Will the wealthiest countries with the strongest armed forces want to share the insufficient and dwindling amount of oil with the poorer countries? Is it the case that the democratisation of the western societies has been made possible because oil has liberated previously low-paid manual labourers from their heavy burdens and has been able to mitigate and almost abolish the former subdividing of society into social and economic classes? And is it only possible to preserve concepts such as humanism, human rights and fellow feeling as long as oil is our invisible slave in the cellar of society? Was slavery abolished in the USA on condition that the work of the slaves could be carried out by steam engines and then later on by oil-driven engines and mechanical equipment? How much of modern society's world of ideas, cultural life and social structure really runs on oil?

But perhaps there is something positive too about a future where we live with a shortage of oil. The flow of waste and the greenhouse effect will slow down. We will look after our things and repair our bicycles. We will be compelled to spend more time doing manual work, eating local produce and we should consequently become healthier people. A long journey will be an adventure that we can talk about for years to come.

Today’s overabundance of material things will diminish to more reasonable proportions and perhaps lead to a different and more meaningful social life with a more vibrant culture. What can we do without using oil? As soon as students from the School of Music step inside a day nursery, the children put down their plastic toys eager to listen and try out the musical instruments that are so full of life. Maybe in the future, people will feel a sense of relief and will remember the oil era that is now drawing to its end as a stifling, materialistic prison.

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