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Anthropology and the Fossil Fuel Era

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emerging today must be addressed squarely. For all her vivid writing and journalistic effort, Naomi Klein's monochrome synthesis promotes only a politics of evasion and despair. The world society that has developed in the last half-century has some features never seen before and many that are perennial. Any way forward will be worked out by China, Europe, the USA and regional leaders such as Russia, India, Brazil and South Africa. They will build on an existing diversity that is hardly illuminated by catch-all phrases like 'neoliberalism' and 'American capitalism'.

We are in the middle of an economic disaster, all right. So far the politicians, bankers and CEOs who got us into this mess seem to be surviving, even prospering. But before long, people everywhere will be asking loudly 'What happened to our money, our jobs and our houses? How did we let them get away with it? How can we make sure it doesn't happen again?' Things are likely to become a lot more turbulent yet, and debates about political economy will then need much more historical substance than literary fashion seems able to offer at present. ●

## Anthropology and the fossil fuel era

Guest editorial by Thomas Love

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Humanity today faces several converging crises, but our prolific use of fossil fuels, particularly oil, underlies and links together several of these, including pollution and global warming. Our need for continued access to fossil fuels drives many of the conflicts we see today, whether in the Middle East or elsewhere. Should growth in demand continue to outpace a declining supply, we shall be forced to make difficult choices about our ways of life.

In his essay on energy and human evolution, the late David Price noted how human beings use energy as heterotrophs, in other words by capturing and storing autotrophs (which in turn store energy from solar radiation). Humans differ from both autotrophs and other heterotrophs in their abundant use of extrasomatic energy, i.e. capturing and storing energy outside of the body. Following Leslie White, Price argued that humans have used this energy to sustain life in ever denser settlements requiring plenty of cheap energy. Once energy becomes scarce, humans have problems: 'if there are survivors, they will not be able to carry on the cultural traditions of civilization' (Price 1995: 1).

Humanity is already in ecological overshoot (Catton 1980). No known alternatives have the quality and usefulness of our current energy base. A barrel of oil contains the

energy equivalent of about 25,000 hours of human labour; the average citizen of an OECD country now lives materially better than the wealthiest elites a century ago. People around the world, especially in India and China, are stepping up their consumption of fossil fuels.

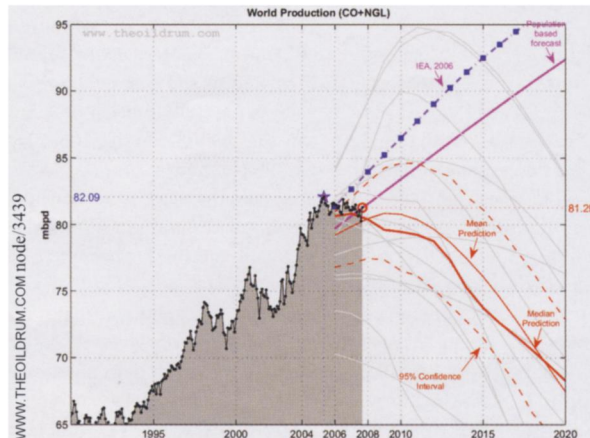
From the mid-19th century onwards, petroleum (literally 'rock oil') and other fossil fuels took over from horsepower, wood, whale oil and coal. With their apparent abundance, we quickly found a multitude of uses for them. Modern civilization is built on cheap fossil fuels, which accounted for 88% of the total commercial energy consumed in 2005, with oil alone constituting 39% of that total. Oil is at the hub of the world economy. Humanity's seemingly insatiable demand for it has transformed human life and cultures in producing and consuming societies alike. The price of food and agricultural products, petrochemicals and plastics, the cost of anything transported by air or over land rises with the price of oil. Rising oil prices contribute to inflation and influence monetary policy and interest rates, and in turn affect US, UK and other countries' foreign policies. The appeal of the US dollar as a world currency is being reduced as US domination of world oil markets diminishes, and access to oil has become a matter of national security deemed to merit military intervention.

Oil is so vital to our growth economy today that we find it almost impossible to imagine a world without it. Whilst the notion that we are near the peak of world oil production is still being debated, with oil prices doubling in 2007 to now surpass an all-time high of US\$100 a barrel, the stresses and strains of inelastic supply are beginning to show and are not easily resolved. Escalating oil prices are already encouraging development of alternative energy sources, but this hardly helps us deal with oil's scarcity in the short, medium and even long term.

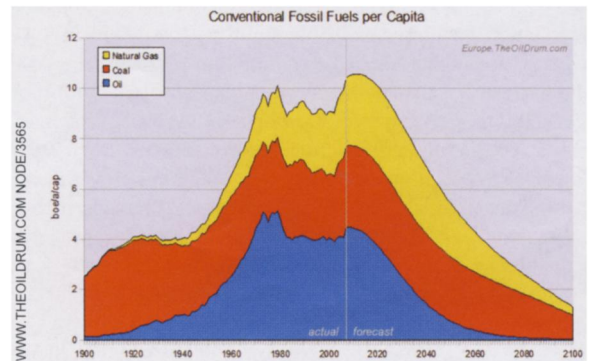
We are in the last days of cheap oil. Based on 13 models, Figure 1 shows how world oil production is predicted to peak between 2008 and 2010 at 77.5-85.0 million barrels per day (Foucher 2007). Decline in the rate of production after 2010 means that we need to find large new deposits every year just to stay even, let alone fuel the growth in demand we are experiencing. We are now consuming oil at four times the rate it is being discovered; coupled with increasing domestic demand in the oil-producing and other non-OECD countries, this portends serious shortages in the near future. Figure 2 adds natural gas and coal to this analysis, along with population growth trends, to demonstrate how humanity faces an imminent crisis of peaking fossil fuels (de Sousa 2008).

No known combination of alternative fuels can be scaled up quickly enough to avoid major supply shocks in the short and medium term. Since alternatives to oil can be used to produce electricity, rather than primarily liquid

**Fig. 1.** World oil production from 1990 and as forecast through to 2020 AD.



**Fig. 2.** Consumption of conventional fossil fuels per capita, actual and as forecast through to 2100 AD.



fuels, electrification of industrial processes and transport is essential. But what combination of nuclear (with all the concerns surrounding it) and renewable sources will be the primary means for generating electricity? While renewables (wind, solar, hydro, tidal etc.) will help, and impressive developments are already under way, we need a crash programme of renewable and nuclear development at least ten years before oil production peaks to avoid the disruptions which now loom (Hirsch et al. 2005).

\* \* \*

Nobody can predict how this will unfold. Maybe some combination of genetically modified organisms, nuclear power, enlightened leadership and luck will make for a softer landing for most. Meanwhile, in the medium term at least, we need to prepare to face the consequences.

Rising energy prices may prolong availability for those who can afford it, but they will cause uneven economic contraction and threaten globalization. They will contribute to the deterioration of labour conditions in sweatshop economies. If the growth paradigm itself is threatened, people may borrow and consume less, ushering in a deflationary spiral after initial inflation from higher oil prices. Devaluing currency is a policy often used to respond to the mounting costs of maintaining complexity and the state's deepening fiscal crisis (Tainter 1988).

Intensification of class conflict seems inevitable. While the poorest people will suffer first and most, both those on the global periphery and the lower classes in the industrial centres, with economic contraction middle classes will feel downward pressure on wages and be hard pressed to keep suburban sprawl functioning. The Asian regions that industrialized too late in the cheap fossil fuel era seem likely to be hard hit.

As we begin to reach these limits to growth, a broad process of relocalization – more reliance on regional and local products and systems – is already under way. This has many implications, from learning new skills of production to developing and rediscovering forms of social capital and relearning what it means to live in local community. On the other hand, how will hard-won universal rights be defended in a more fragmented, relocalized world?

Of particular concern are agriculture and the dependence of the industrialized food system on cheap fossil fuels. How are seven billion of us going to feed ourselves? The UN predicted 2007 as the year when more than half the world's people would have become urbanized, and the majority are dependent on oil-derived agricultural products. Freed up from direct agricultural production, most people now are deeply ignorant about how food is produced and where it comes from. While people in the developed economies have yet to see serious increases in food costs, the converging forces of climate change, markets and attempts to diversify out of fossil fuel (e.g. into bioethanol) are already resulting in soaring grain prices, seriously affecting the world's poor majority. Nevertheless, the total amount of fossil fuel devoted to agriculture is still small in relation to the overall economy. As oil scarcity effects deepen, people and governments will have to prioritize food at the expense of other uses, with huge policy and economic implications.

Political pressures to address declining net energy are building, entailing what appears to be the increasing militarization of energy supply chains. With Europe's growing dependence on Russian natural gas, for example, one can imagine major geopolitical realignment. The oil-driven world economy is basically run by a set of mutually dependent elites (the Saudi royal family and US offering a type case) who are all aware of the difficulties of maintaining security of access to supplies.

Economic contraction will certainly deepen states' fiscal crises and instability. Should there be a big turn toward nuclear energy, how well will weakened states maintain the centralized control and management nuclear power requires? A big push toward solar, wind and other renewables, on the other hand, suggests other consequences. New political power may accrue to states in the solar energy- and biomass-rich tropics.

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The complexity of the interwoven problems sketched above calls for a holistic examination to which anthropologists can contribute by documenting and understanding how people make sense of these issues and frame their responses. How does this crisis resemble previous ones? What metaphors and symbols do people use to make sense of it all? To what discursive structures will people turn to make sense of the potential unravelling of their worlds? How has the fossil-fuelled growth system already affected the lives of people in producing areas?

We need cross-cultural perspectives and commitment to ethnography to understand how such large-scale forces play out on the ground in the everyday lives of ordinary people. Detailed grasp of the non-fossil-fuelled ways of living of pre- and non-industrial peoples will convey to interested publics and policy-makers alternative ways of organizing human society. We can help understand how humans might manage to power down without precipitating collapse.

Peak oil pessimists envision a return to harsh pre-industrial agrarian conditions. Some rely on Joseph Tainter's (1988) work, which represented collapse of complex societies as an economizing strategy: the marginal costs of maintaining complexity simply become no longer worthwhile to bear.

Yet the spectre of marauding bands of starving urbanites need not materialize. Recent research suggests that humans are genetically predisposed to fairness, even at cost to ourselves: think of the normative pressure among foragers toward generalized reciprocity (Heinrich et al. 2004, Richerson and Boyd 2005). This would suggest that powerdown could be managed if the burden of reducing consumption were shared more or less fairly, as is indeed evident in experiences of scarcity in the industrial countries during the Great Depression and World War II as well as the daily burden of living on a low energy budget for the world's poor majority. Economic contraction would encourage ethnogenesis and cultural diversification, making use of known and new cultural materials. But how might emerging local communities protect local adaptations from the corrosive effects of corporate-driven, mass media-propagated high consumption?

Cheap energy made it possible for the offspring of a temporarily prosperous middle class to be freed up from manual labour and to savour philosophy, literature and the arts. Anthropology itself is hardly immune to these larger processes, having been constructed in the flush of 19th-century industrialization, when fossil-fuelled industrial production helped liberate significant proportions of humanity from drudgery, disease and poverty. Large conferences and frequent trips to distant research sites will become more difficult.

Wandering around Washington, DC, at the 2007 AAA meetings, I recalled my visit to the majestic crumbling pyramids at Tikal; I wondered how future archaeologists might gaze at our monumental architecture. Will they grasp how power was accumulated and exercised, how global was the reach of this civilization, how temporarily prosperous was the average person's lot in life before conflicts over energy so fundamentally changed our lives? Let us examine the real crises upon us. ●

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