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Material witness: *Faux* food to the rescue?

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Told that I wanted to study chemistry, my school careers adviser suppressed an expression of panic to suggest that there were opportunities for chemists in frozen foods. My father was not a scientist of any sort, but he discerned with disdain that food science wasn't exactly at the cutting edge of research, a judgement with which I concurred.

But now I wonder. In a recent essay (http://www.prospect-magazine.co.uk/start.asp?P_Article=12702), political analyst Michael Lind argues that all the world's predicted future population of 9 billion might achieve the living standard of developed nations without despoiling our planet. Indeed, Lind thinks that it may be possible for such a global society to coexist with larger areas of wilderness than are preserved today.

Lind's Panglossian arguments invite copious criticism; but how does he propose to realise this miracle anyway? New technology is the main answer. "Sometimes", Lind says, "there really are technical fixes." The owner of a ranch in Texas, Lind makes agriculture one of his primary concerns. How will we feed 9 billion people especially as greater affluence is accompanied by an increased meat intake? "A pasture and a cow", Lind admits, "is an extremely inefficient way to convert soil, water and sunlight into a steak."

What's the alternative? "I would rather eat a nutritious pork chop from a laboratory test tube than from a pig which had spent its life drugged in a tiny cage caked with its own waste", Lind argues. By making meat artificially, we would liberate masses of land that can revert to wilderness.

It is a truly Baconian vision, in which food is made "entirely from raw materials and artificial energy in a subterranean food factory". Nigel Calder, former editor of *New Scientist*, talked in his book *The Environment Game* (1967) about "nourishing but unpalatable primary food produced by industrial techniques". But Calder envisaged this as animal feed, not for human consumption. For us, it would have to be palatable too.

Nonetheless, the image this invokes is of trays of 'astronaut food', with all the right nutrients but frankly as appealing as baby food. That is where the materials expertise of food scientists enters. There is now plenty of research showing how the texture of food affects the sensory experience — the pleasure — of eating it. (See, for example, *J. Agric. Food Chem.* **50**, 5149; 2002.) Clever engineering of processed foods could make bland, 'plastic' cheese and meat substitutes a thing of the past.

I am not sure I'll ever be a convert: I take Lind's point that free-range livestock is potentially (if not inevitably) wasteful of land, but I do wonder whether he has tasted the difference between a free-range and a battery-reared chicken. On the other hand, as a lapsed vegetarian I do feel some eagerness for food scientists to perfect the texture of *faux* sausages and bacon. It should not be hard to make food substitutes nutritious; the greater trick will be to make these things acceptable to food snobs. Food scientists may be unglamorous, but chefs are today's rock stars. Which of them will be first to make a gourmet dish from artificial meat?