

THINK POSITIVE, THINK RADICAL

THOUGHTS PROMPTED BY THE RECENT STUDY¹,

“CAN TOTNES FEED ITSELF?”

The relevant points can be grouped under five headings:

1: *The general question – “Can a small town feed itself?” – is much simpler than it can be made to seem.*

We can agree, for all kinds of reasons, that it is desirable to produce as much food as possible, as locally as possible. “Local” means what can be grown in the city itself and its suburbs, and in the immediate environs.

Then, if we choose, we can do endlessly complex studies of what can be done by whom in particular places, and how much food each place needs, and so on and so on. If we did this exhaustively and factored in all we can think of, we would finish up with a computer model more complex than the ones that NASA has for long-term weather forecasting. All too easily, then, if we go down that track, we finish up throwing up our hands and saying, “It’s all too much!” Or, “We need more data and more computer power!”

Or we can simply acknowledge that in practice, wherever people live, in rich cities or poor, tropical or temperate, there are two forms of farming (broadly defined) that can always be carried out *within* any city or suburb; and some that usually can’t.

What all cities can do is make space for horticulture, meaning garden-scale growing, essentially plant-by-plant. It is always possible as well to incorporate at least some of the omnivorous forms of livestock – poultry and pigs – which are mostly fed on left-overs (generally with just a bit of supplement).

In the immediate environs of the town, there can be more horticulture and small-scale livestock, of course – but also the local farmers can and probably do grow the kinds of crops that grow well in the particular region, on the field scale. Thus if the city is surrounded by grassland, as

¹ The project paper can be found at <http://www.geofutures.com/wp-uploads/2009/07/CanTotnesFeedItself1.pdf>

Oxford more or less is, then we could get all or most of our dairy produce from close by, and probably a fair proportion of beef and sheep (and pigs and poultry can graze more than they are generally allowed to do as well). If the city is in Suffolk, say, then wheat is available locally – meaning local flour, milling, and bread become more than possible (as well as local beer, which is already well established).

So the problem of providing local food boils down to a few simple guidelines:

(i): Develop urban and suburban horticulture as far as possible – gardens, scrap lands, whatever.

(ii): Make best use of whatever grows in the particular environment around the town – milk from grass, local flour, whatever.

(iii): Import whatever does not grow locally from further afield. It always makes sense to spread the net to fill particular needs. Thus Britons like tea, coffee, cinnamon, and bananas – and provided all is done fairly and with proper respect for fellow creatures and the environment, etc etc there can be no objection to such trade. Nowadays livestock is shifted around Britain mainly in the interests of profit, and very dangerous this can be – but there are also legitimate reasons for moving animals. Lambs born on the hills of Wales, Scotland, or the north of England, are traditionally fattened on the lowlands, typically further south. Often we find that traditional practices, based on common sense and practicality, provide all the solutions we need.

Overall, common sense says that all communities should try to produce as much of their food as locally as possible. But no community can sensibly produce all that it needs and the only problem is to ensure that the necessary trade is carried out fairly, with due regard for the environment as a whole, and in line with the principles of good husbandry.

It also follows that elaborate models, analyzing overall ecological footprints of particular communities in fine detail, are not necessary. So long as we do the best we can within the guidelines we can't really go wrong.

2: Can we really produce enough just by following simple rules? In particular, can Britain really feed itself?

For various reasons (spelled out elsewhere in this blog) it is surely desirable for *all* countries in the world to be as self-reliant as possible in food. Self-reliance does not mean 100% self-sufficiency. It simply implies the ability to produce enough food to feed the home population well when the chips are down – that is, when supplies from abroad are compromised (which can happen for many all too plausible reasons). So the question that Sir Kenneth Mellanby first asked in the early 1970s, and Simon Fairlie in particular has continued to ask – “Can Britain Feed Itself?” -- is perennially pertinent.

But again, this question can be made to seem infinitely complex – or very simple. The simple model begins by asking what people actually *need*, in the way of food; then asking how much food can reasonably be produced per unit area; and then asking whether Britain has enough land to provide all that’s need. The answer, just to anticipate, is that we easily have enough farmland land to provide all of the 70 million people who seem likely to live on these islands to the very highest standards. What exactly is supposed to be the problem?

The simple model (which I favour) is based on irreducibly simple calculations. It has not attracted a great following but no-one has yet told me what is wrong with it. So here it is again:

In a nutshell: the human diet for practical purposes can be divided into macro-nutrients (energy foods and protein) and micronutrients (essential fats, vitamins, minerals, and a growing and little understood catalogue of what are sometimes in commercial circles called “nutraceuticals” but might be called “paravitamins”, including for example plant sterols and a host of anti-oxidants). In practice, energy foods are mainly carbohydrates and fats but of these, carbohydrates (mainly in the form of starch) require far less energy to produce, and for this reason alone should be the chief source of energy (as in practice is the case in the world as a whole). Macronutrients by definition are the things that need to be produced in serious bulk and so require the lion’s share of the land to produce. So it makes sense, in planning the whole agricultural lay-out, to cater for the macronutrients first and then fill in the micronutrients.

So let’s begin with our energy requirements. People on average need a little less than 3000 kcals per day – so 3000 per head is a reasonable goal. Now we encounter a huge serendipity – one of many in the field of food. For the chief source of energy for human beings is or are the seeds of plants; and in particular, in the present world, the seeds of cereals; which in Britain mainly means wheat. It happens to be the case that cereals

contain starch and protein in more or less precisely the ratio that human beings need. So if you produce enough wheat to provide people with enough energy, you will automatically produce enough protein too.

So at least as a hypothetical exercise – but it’s a good place to start – we can ask, “Can we grow enough wheat in Britain to provide everyone with their 3000 kcals per day – plus their daily requirement of protein?” If so, then in principle we will have cracked the macronutrient problem. We won’t exactly be home and dry, but we will be within hailing distance.

Well, one kilogram of wheat provides roughly 3000 kcals (plus all the protein the average person needs). So one kg of wheat per person per day will do. One tonne is 1000 kg and there are 365 days in a year so – roughly speaking – we can say that each person needs one third of a tonne of wheat per year (and – another small serendipity – it transpires that one metric tonne is almost exactly the same as one imperial ton).

Have we enough arable land to provide everyone with a third of a tonne of wheat per year? In 2007, the *average* yield of wheat in Britain was 8 tonnes per hectare (about three tons per acre – roughly three times what it was a hundred years ago). So if one person needs one third of a tonne in a year, it seems to follow that one hectare of arable land could supply all the macronutrients for 24 people.

The projected population of Britain is 70 million. At 24 people per hectare, it would need 3 million hectares to provide enough for all of them. Do we have 3 million hectares? Well, Defra’s figures show that 3 million hectares of arable land is exactly what we do have.

That’s the macronutrients taken care of. But human beings do not live by starch and wheat protein alone. Have we enough land left to produce all the micronutrients?

Defra’s figures tell that Britain has 18 million hectares of farmland – six times as much as seems to be needed to provide everyone with their basic macronutrients. So that leaves five-sixths for the niceties – to be supplied by other arable crops (including potatoes and field-scale beans and brassicas), plus livestock of all kinds, plus horticulture.

What is supposed to be the problem?

Again we come back to the generalization: just practice common sense husbandry well; stir in a bit of science (because in principle there is

always room for improvement and science in theory is good at working out what needs to be done); and away we go. There really should not be a panic, or any particular need for exotic economic theories or way-out science. We just need to eliminate the negatives – which unfortunately include a dedication to a global economy that is totally destructive, and to high technologies that are intended purely to maximize wealth, and a government that sees itself as an extension of the corporate boardroom. These are global issues to be sure, even more immediate and threatening than peak oil and climate change. But they should not be problems intrinsic to farming.

3: Positive thinking (1): We do not need to be austere. The future belongs to the gourmet.

In almost all learned reports about the future there is a terrible air of solemnity. Peak oil, economic collapse, and climate change are “the triple crunch”. The received truth is that we – human beings at large – loved the world that ran on cheap oil and borrowed cash, and are distraught at their demise. The truth is the complete opposite – at least as seen by many of the people I have known since the 1960s. With oil reduced to scarcity (although there is enough if it’s used with good sense to take us through the next 1000 years) and the debt economy finally discredited, there is a chance for civilization to resume its course – and to start producing excellent food for all. Climate change is another issue – truly the joker in the pack that needs to be taken very seriously indeed – but even here there is serendipity. The things that we need to do to farm well, as if we really wanted to feed people, are precisely the things that are needed to help ameliorate climate change, and to adjust to it as it comes about.

We are also told, more specifically, that post-oil farming will inevitably produce a diet that is austere. In particular, we are told, meat will be a rarity, and is this is presented to us as a great disaster. No more KFC! Oh dear! Will life be worth living?

In truth, in good farming, there is *always* room for plenty of livestock. The poorest Chinese villages, when they are left to get on with things, have ducks, chickens, pigs, and fish (commonly grass carp raised in the paddy fields). Britain has 15 million hectares that it does not need for arable crops – most of which is grass, and grass means cattle and sheep (and pigs and poultry profitably graze more than is commonly appreciated). Graham Harvey’s excellent *The Carbon Fields*, and Bob Orskov’s excellent research around the world (to be written up on this blog asap) show what huge potential there is in the world at large for

livestock raised both on grass and on browse (the leaves and branches of trees – which in the wild they typically delight in). To be sure, if we stopped using oil to raise grain on the vast scale we do now, we would have less livestock than now – but we would still have a great deal, and it would be far tastier than today’s grain-fed kind, raced pell mell from conception to slaughter (and there is no point in meat that is not tasty). The food industry’s argument – that grass-fed animals produce more methane than cereal-fed beasts – is more than countered by Graham Harvey’s point that the grasslands that produce traditional livestock are massive carbon sinks, while the oil-based fertilizers and ploughing required for high-yielding grain is astonishingly carbon-profligate. Again, there really is no substitute for common sense – and again, commonsensical traditional husbandry does what is needed. But alas, science is deployed these days to override common sense.

Here we encounter two more serendipities, as outlined in *Feeding People is Easy*. The kind of “enlightened” farming that uses minimum fossil fuel and is designed to feed people without wrecking the rest of the world produces plenty of plants, not much meat, and maximum variety. These nine words – “plenty of plants, not much meat, and maximum variety” – perfectly encapsulate all the most worthwhile nutritional theory of the past 35 years. So good commonsensical farming in the post-oil age easily produces enough, and what it produces is nutritionally unimpeachable.

Better still: those nine words -- “plenty of plants, not much meat, and maximum variety” – summarize all the basic components of the world’s greatest cuisines. Provence, southern Italy, North Africa, Turkey (probably the best of all), Persia, India, China – in all those fabulous cuisines meat is used only for stock, as a garnish, and for occasional feasts. We are told by the commercial powers that be (and of course by government which takes its lead from big business) that people “demand” more meat as they become richer, so that by 2050 the world will “need” to double total meat supply. That has become the mantra. But the story with meat is the same as with money. If you have none at all then you would usually be much better off with a bit (although there are some excellent native vegan cultures, as southern India and Japan). But once you get a little above the minimum, more simply becomes vulgar. The Chinese mandarins, richer than Croesus, gave the flesh of the duck to the servants and ate only the skin – hence Peking duck. Great French and Italian cooking doesn’t use much meat. The Turks and Lebanese make feasts from cracked wheat, broad beans, olive oil, and mint.

In short, we don't need vast gouts of flesh produced in cages and feedlots from oil-fed grain. We just need to re-learn how to cook. More broadly, we need to re-vivify or indeed re-create food culture – but this is the last thing the food industry would want us to do. The Slow Food Movement has a serious role to play here.

4: Be positive (2): Take horticulture seriously

Horticulture is the thing that everyone, and certainly every community, can practice. So we need to ask two kinds of questions: “How much food can horticulture really produce?” And: “What, in principle, could horticultural crops really contribute to our diet?”

4.1: How much can we get from horticulture?

Hopkins, Thurstain-Goodwin and Fairlie tell us in their Totnes report that during World War II, people managed to produce about 40 tons of vegetables per hectare per year. In terms of sheer bulk, this is about five to ten times more than is produced from modern wheat fields in Britain – although whether 40 tonnes of vegetables produce more food calories and protein than the eight tonnes of wheat produced on the average British farm is harder to say (it would be good to get some figures on this, if anyone can help!).

So 40 tonnes per hectare seems impressive – but how impressive is it really? War-time amateur growers were enthusiastic but they had plenty of reason to be tired. For the most part too they were starting from very low base (our own garden in South London was pure clay not far down, not least because it has been dug up for an Anderson shelter) and inputs perforce were minimal (I remember ad-hoc cold frames made from bits of bombed houses). Modern British people generally speaking have far more spare cash than the wartime generation. I recently bought half-shares in an excellent 14 foot x 8 foot greenhouse that cost less than £700. Add a few hundred for a floor and staging and it's still less than £1000. You could buy ten of that size for the price of a small family car. But even one would be enough to change your life. Heating is desirable and can be ludicrously expensive but again, thinking positively, there is ample scope for combined heat-and-power using low-grade heat, and solar panels and all the rest. A government that put our money behind such schemes could transform the country. Since the present and foreseeable governments are unlikely to do any such thing, we have to do it ourselves – and the necessary technology is all out there, much of it traditional, and in principle not difficult. The name of the game is Renaissance, and the

point of renaissance is to use present resources – including cheap greenhouses – to lay the foundations for the future. A greenhouse can last for at least 100 years.

What kind of yields can growers expect under glass, with loads and loads of tender loving care? Again, I would be grateful for information on this. But I would be very surprised if it is less than 500 tonnes per hectare (and I suspect much more). In short: think positively about the spaces in and around cities, invest some of the time and money that is now spent on bigger cars and the rest -- and the possibilities for self-supporting horticulture become very great indeed. Of course, too, it doesn't all have to be under glass. It's just that it seems useful to think first of what is possible if you invest maximally in time and cash. Then, in the spirit of J F Kennedy, we can ask "So why not?".

Given that we could, if we really took it seriously, have horticultural produce coming out of our ears, we can ask the next question:

4.2: What can horticulture really contribute to our diet?

At present, horticulture – fruit, veg, and culinary herbs and spices – is seen primarily or indeed exclusively as a source of flavour and texture, dietary fibre, and micronutrients. This is far from trivial. Vegan diets for example become possible with good fruit and veg, but are quite impossible (and intolerable) without. The great, low-meat cuisines of the world rely very heavily on highly flavoured and astringent plants grown in gardens or gathered from the wild. Even so, because horticulture is not regarded as a serious source of macronutrients the main burden of serious nutrition is thrown back on to the arable crops, which in effect means cereal. In short, however seriously we may take horticulture, we still tend to regard it as a secondary pursuit. The serious stuff is left to the big guys.

But is this really the right way to look at horticulture? Could it contribute macronutrients too in significant quantities? The question – at least in the west – is still up for grabs, and it should be addressed. Five lines of thought in particular seem particularly intriguing:

(i): *Pulses*. Cereals are the world's chief source of food energy and protein but peas, beans, and lentils in general contain more protein – sometimes more than three times as much. Furthermore, pulse protein in general is rich in lysine, whereas cereal protein is low in lysine; but pulses tend to be lower in tryptophan, while cereals have a lot. So pulse

and wheat protein complement each other beautifully (as manifest in chapattis and dhal, tortillas with frijoles, beans on toast, and so on).

Pulses worldwide are often grown on the arable scale – but also on the garden scale. Garden-scale pulses in Britain are mainly served as green crops – as in peas, broad beans, runner beans, etc. But they *could* be grown for dried seeds -- pulses in the proper meaning of the term – and could then become significant macronutrients. Broad beans were a staple both in Egypt and Greece, and of course they grow well here.

(Fermented pulses are of great potential interest too. A few years ago the Vegetarian Society under Dr Alan Long were making tempeh out of broad beans but they seem to have stopped. A pity).

(ii): *Small scale cereals*. Apart from sweetcorn, the Brits in particular do not grow cereals in gardens. Indeed the idea seems outlandish. But John Letts in Britain and various pioneers in the US point out that it can at least be fun to grow traditional and ancient varieties of wheat and other cereals (rye and oats in particular) on the garden scale, and harvest them with a scythe, and stone-grind the flour on the smallest scale, and so on. This could be done on a nutritionally significant scale – if enough people did it. In any case, horticultural-scale cereal deserves to be taken seriously – and is a very good potential way of conserving the much-threatened genetic diversity.

(iii): *Oil seeds*. People need fat, and oil seeds are and should be a significant source of it. In the Mediterranean, olive oil is no mere condiment. Often through history it has been a significant staple. Britain's principal oilseed is rape, which is rather unfortunate, followed by linseed, which is used in animal feed and for oiling cricket bats but I confess I don't know its culinary potential. Maize and oats should be good sources. On a horticultural scale, particularly with glass to assist, sunflowers surely have great promise. Others need looking at. This again is where we need good, radical research (something more thoughtful than GM rape).

(iv): *Nutritious fruits*. Some fruits provide significant quantities of fat (notably the avocado) and some, for example from the Cerrado of Brazil, have significant protein. Avocados can be grown in Britain under glass. In general, again, we could do with some truly radical research to see what there really is out there, and what could be grown.

(v): *Small-scale agroforestry*. Agroforestry – rightly – is becoming a buzzword; one of the few positive signs on an otherwise largely

depressing horizon worldwide. Agroforestry can be practiced on a very large scale. Indeed, Martin Wolfe says that *all* farming should be considered as an exercise in agroforestry, and when you see his own farm in Suffolk, you begin to see that he is surely right. But it can be practiced on a very small scale, too. An apple tree with chickens underneath is the beginnings of agroforestry. A few walnut trees become significant sources both of flavour and nutrition, and again combine readily with livestock and herbaceous crops. Perhaps we need a new term: “hortoforestry”.

5: Some very basic questions

The discussion so far has raised many questions that need research. One more general issue that remains outstanding is the proper role of organic farming. Most knowledgeable people agree that its principles are highly desirable and that, wherever possible, organic husbandry should be the preferred option. But still we need to ask whether it is always possible, or ideal – and if not, how much we should compromise. Notably, there is a ban on “artificial” nitrogen: nitrogen that has been turned into nitrate in a factory by the Haber process, by which nitrogen is combined catalytically with hydrogen to produce ammonia which is then oxidized to nitrate. But artificial N can at least give a useful boost when crops most need it. At present, the Haber process is powered by oil which makes its production highly problematic – but couldn’t the necessary electric power come from solar energy, or wind? Why shouldn’t we have small-scale, in situ production of nitrate from atmospheric N?

In short, the Totnes report has much to commend it. But it should be seen as a contribution to a very big debate that should involve us all.

Postscript:

This and all the other questions raised in this essay could and should have been addressed decades ago, and would have been addressed by any government that was truly alert to world trends. There are many other questions, too – scientific, economic, sociological, moral, practical. Since the government is unlikely to act this side of food riots (which it will treat at “terrorism” and call out the riot police) people who give a damn need to ask the questions for ourselves. All this reinforces the case for the College for Enlightened Agriculture, to be established as a people’s movement.

