

Genetic Engineering: much food, many problems – no solutions . . .

Anthony Trewavas, a plant biologist at the Institute of Cell and Molecular Biology, University of Edinburgh, has written an article for *Nature Magazine*, “Much food, many problems”, in which he presents GM foods as the best hope for feeding future generations. *Nature* is one of the most reputable sources of information on contemporary science. Its editor, Roger Perles, is not only literate and intelligent, but also a gourmet of considerable discrimination. A couple of years ago we shared one of the best meals I’ve ever eaten, a *menu degustation* at Buerehiesel in Strasbourg, in which seasonal ingredients were unostentatiously prepared and served with a simple perfection worthy of California cuisine at its finest.*

Over dinner we also shared our admiration for the science historian T.S. Kuhn. His seminal work, *The Structure of Scientific Revolutions* (in itself a revolutionary force), demonstrated half a century ago that scientific knowledge is not a steady accretion of complementary discoveries, but a succession of theoretical structures, each of which survives only so long as it is a useful container for observed phenomena. When the facts no longer fit within the structure in an orderly fashion, it is discarded and a new theory takes its place.

Such revolutions occur infrequently. “Normal science,” he writes, “the activity in which most scientists inevitably spend almost all their time, is predicated on the assumption that the scientific community knows what the world is like. . . . [It] often suppresses fundamental novelties because they are necessarily subversive to its basic commitments. . . . Scientific training is not well designed to produce the man who will easily discover a fresh approach.” (This was exemplified in Preston Sturgis’ superb comic film *The Great Moment*, a witty biopic of the déclassé dentist who discovered anesthesia. Even Paramount’s hack-handed reediting wasn’t able to destroy it.)

In a word, normative science is totalitarian and so has become the ideal tool of world capitalism. The roll call of its favoured projects and positions — accelerated fossil fuel consumption, atomic power, intensive agriculture, BSE denial — shows how insensitive this collaboration has been to the welfare of the planet and its inhabitants.

WHEN Kuhn wrote almost half a century ago, he was able to assume that the principal reason for conservatism within the scientific community was not corruption but self-preservation. Pure science, as opposed to technology, was largely financed and controlled by institutions of higher learning, which professed a dedication to truth as an end in itself. Although there were enormous projects paid for by the military, they tended to be compartmentalized and did not necessarily pervert the entire educational structure.

But as state support of the universities dried up, they became more and more dependent on the direct sponsorship of industry and commerce, thus allowing the latter to dictate not only the areas of research projects but also their outcome. Science as a whole readily adapted. According to a recent Guardian investigation, “The line between academic and commercial research is increasingly blurred; it is common for hospital and university scientists to found or have shares in biotech firms.” Thus scientific knowledge can be manipulated for profit, a form of *de facto* insider trading. In government this is regarded as conflict of interest, but in our universities it has become the lucrative norm.

If Trewavas, as a plant biologist, has “little time for big, insensitive agribusiness,” he is indeed fortunate, if not unique. A group of British scientists has recently become so concerned about

industrial influence that they went public with a corporate statement that 54% of their colleagues had not only been engaged by industry to carry out specific research, but were also told in advance what conclusions would be most acceptable. (They mercifully refrained from telling us to what degree they had capitulated.)

“Almost without exception,” says Trewavas, “opponents of GM foods are not plant biologists.” This is no more surprising than the fact that very few opponents of extended motorway networks come from inside the automotive industry. Such self-interested bias, once in place, is not easily dislodged. Trewavas writes of the so-called “green revolution” with an enthusiasm which most of the Third World does not share. Its goals and methods were determined in advance by the agro-chemical industry, so that it became an instrument of selling monoculture to countries which had previously grown a variety of foods for their own consumption. They were thus at the mercy of the developed countries and their corporations, which sold them expensive sterile hybrid seeds and fertilizers, and could then dictate the prices that would be paid for the new crops. These, unlike their traditional crops, were not useful as local food, but only as a medium of exchange, and so the countries involved became prisoners of the “company store” on a global scale. Productivity did indeed increase, but the products went to the developed world and the economic benefits to the corporations and to their corrupt stooges within the local population. Those “improved” foods which remained for local consumption were generally lower in nutrients than the traditional varieties which they had replaced.

HAVING established the green revolution as a “good thing”, Trewavas feels free to endorse the world-wide spread of GM foods, based on the same premises. In spite of the time and money that the supranational corporations have spent on patents to establish exclusive property rights, he assumes that these discoveries will be distributed cheaply to the poor for their own benefit. But the whole point of Terminator technology is to make even more inexorable the control which was begun with sterile hybrids. Even Monsanto was forced to realize the global indignation this aroused and publicly promised to abandon it.

The promise was an empty smokescreen. Twenty-nine patents have already been issued on the latest generation of GM technology: “Traitor” species which introduce genetic traits into food plants that make those plants dependent on the external application of a corporation's proprietary chemicals to bring in a crop. By this clever maneuver, the corporations are no longer saddled with the expense of growing and distributing each new season's supply of seeds; instead, the farmers may use the new seeds which each year's crop produces, so long as they continue to purchase the chemicals which will activate them. Thus even plants will be turned into junkies! William Burroughs, you should be alive to celebrate it.

WHEN he turns his attention to superweeds, Trewavas is on equally shifting ground. He cites the enormous variety of alien species which have done environmental damage. But “alien” and “damage” are in this context loaded words which presuppose certain values, usually aesthetic and anthropomorphic. A crucial moment in my intellectual awakening came when a passage in my college biology textbook caught my attention. Malaria, it said, was perpetuated by two carriers, men and mosquitoes. In order to stamp it out, the cycle had to be broken. “Following his natural bias,” wrote the author laconically, “man had chosen to eliminate the latter.”

What species are truly indigenous? After what date do they become invaders? Many of those in charge of our forests insist sentimentally on planting only trees which pre-date the ice age, going back thousands of years—of which there are only five! Such standards of authenticity are as arbitrary and unrealistic as the fascistic ideal of racial purity. The “English countryside” as we

know it is in fact almost entirely a human invention. Most of the original forests were long ago destroyed, to be replaced gradually by a selection of flora and fauna which were consciously composed, like a macrocosmic Capability Brown landscape.

It is ironic that, having argued the evil influence of alien species, Trewavas should then welcome the mutant newcomers on the grounds that they are statistically insignificant. One thing is certain: new species whose conception is manipulated and whose development is biochemically accelerated, as in time lapse photography, do not have to prove themselves on a natural evolutionary scale, but can establish themselves without being forced to adapt to the ecosystem into which they are precipitously introduced. As with a sudden flush of industrial poison into a river, the destructive shock allows no interval for dispersal and absorption.

TREWAVAS ultimately gives the game away in his enthusiastic endorsement of social Darwinism, the nineteenth century justification for liberal economics and untrammelled free enterprise: “We live on a planet where the ecology is constructed on a competition for resources,” he proclaims. “Competition is the vital spark that energizes evolution and generates vitality and creativity.” There is no acknowledgement of those biological and social scientists who have demonstrated that cooperation, rather than competition, is the fundamental law of life.

Those who have lived with nature know that its everyday life proceeds much more placidly than the selective adventures of *Through Darkest Africa with Gun and Camera* would have us believe. The deep woods of northern New England, for instance, are a complex interdependent ecology which, after having been deforested and then deserted by European settlers moving ever westward, regenerated itself spontaneously within less than a century.

When aggressive, bellicose humans carry their prejudices into the wilderness, they come out armed with such evidence as supports their preconceptions. If we want to protect the environment — including the human race itself — from the threat of entrepreneurial science, then we must look beyond such science for the ethical impetus with which to combat it.

I SHALL let an English scientist have the last word. Roger D.A. Lipman, a medical device consultant working in Belgium, writes in the Financial Times:

The plant and animal kingdoms have given us many warnings that make most of us wary about having GM foods rammed down our throats. Take the BSE saga for example. One would have thought, for goodness sake, that farmers did not need to be reminded that cows are supposed to eat grass. Evidently this was not the case. The farmers felt the economic squeeze generated by the animal feed companies and the consequences . . . were disastrous.

He comes to the conclusion that fundamental decisions about GE technology, with its promises and its threats, cannot safely be left to scientists, business executives – or, indeed, to politicians:

[This] prospect must have the attention of the world’s great thinkers, in a number of disciplines, . . . so that we can be as sure as possible that we get it right.

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* For those who may be interested, this was our menu:

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Here's today's set meal from Buerehiesel in Strasbourg, a Michelin listing that's worth every one of its three stars. This was like California cooking at its best – not a single heavy sauce, everything prepared in such a manner as to underscore the perfection of the ingredients. Spread out over three hours it left us satisfied but not stuffed. The pigeon breast was the high point, barely cooked but almost fork-tender.

I can't get very excited about frogs' legs, particularly considering how most of them are obtained these days. These were as good as any I've eaten, which, by application of the Pleasure/ Principle Equation (How good does it taste? How uncomfortable does it make me feel?), will lead me to avoid them in the future.

Otherwise, ten out of ten! It must be the healthiest gourmet extravaganza I've consumed since Chez Panisse.

The meal was accompanied by a superb Huegel Gewürztraminer, that exquisitely versatile wine which serves as a universal solvent to a wide range of international cuisines.

MENU

La marinade de Thon, mousseline de Cabillaud et legumes printaniers a l'huile de Basilic

Les Schniederspaetle et les cuisses de Grenouille poelees au Cerfeuil

Le Saint-Pierre, les Moules et Haricots Tarbais, a l'Aneth et au Citron confit

Les tartines grillees au foie de Canard, fleur de Sel et Poivre, petite salade de Roquette et Artichaut
cru

La poitrine de Pigeon au Chou vert, echalotes confites et champignons des bois

La tarte fine aux Figues, glace aux epices

Les Delices Buerehiesel (i.e., the "sweet trolley", with a preponderance of fresh fruit "soups" of various sorts.)

[Accents, which tend to be lost or corrupted in e-mail transmission, have been omitted.]