THE SELFISH COMMERCIAL GENE

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Introduction

Genetic manipulation (GM) or genetic engineering (GE) mean artificial transfer of genes - pieces of DNA - to produce a transgenic organism, *e.g.* jellyfish genes into sugarcane or human genes into cows. The methods of artificially joining pieces of DNA from different organisms' genes were invented as recently as the mid-1970s and are collectively called **recombinant-DNA** technology.

The abbreviations are Hobson's choice between pairs of letters already taken by huge USA corporations - GM and GE - but I'll use them interchangeably.

Technologies for **cloning** animals are, wholly or largely, different. But many concepts for cloning mammals involve not merely trying to copy existing animals but also splicing-in recombinant DNA from other species. Often the idea is to produce some foreign protein in milk.

These techniques no more entail a uniform degree of hazard than does nuclear science. As in nuclear technology, so with genetic engineering: the tag 'nuclear' does not necessarily connote any serious degree of hazard, and some versions of GM or of cloning may well be quite OK.

But some versions are not OK. You do therefore have to perform sceptical analyses of GM proposals if you want to assess their hazards. This is one of many similarities between the two technologies. I wish to point out other similarities - and some differences.

Do not equate GM with the larger category 'biotechnology'. GM is one kind of biotechnology but there are others too. Any attempt to equate GM with the yet wider category 'Life Sciences' is PR deceit (and illustrates how unpopular GM has become).

Genetic engineering's brief two-decade history has been characterised by exaggerated claims of benefit, confusing hope with fact in attempt to allay natural fears (and to stimulate stock-market ramps).

What can it do for you? Here's some typical PR hype:

> Multi-billion dollar new life science industry for the region
>
> It was MAF men Keith Steele and Neil Richardson promoting cows "not as milk producers but as 'biological reactors' producing a vast range of products which could open up multibillion dollar international marketing opportunities for the benefit of the region and the country. Treatment for multiple sclerosis could be only a glass of special milk away. The Waikato is ideally situated as the centre for this unlimited new industry based around the world-famous Ruakura research centre and the excellent [*sic*] University . . . .

Technology using nuclear fission was procured by scientists. It was not initiated by elected representatives. The technical enthusiasts procured the funding for A-bombs and the nuclear reactors which were first created for the sole purpose of making plutonium for A-bombs. Similarly, billions of dollars have been procured for gene splicing by enthusiasts who say they are going to produce organisms, improved on commercial criteria, which could not occur in nature. In our little country, around $120M so far - $18M/y lately - has been procured by gene-manipulators from the government to subsidise a wide variety of GM which the public know little of. (This is one glimpse, by the way, of how sincere is the belief in leaving allocation of resources to 'market forces'.)

The monstrous blind alley of nuclear power stations should teach us how far astray society can be led by technical enthusiasts who act something like a priesthood presiding over an arcane speciality which they naturally don't want obstructed by any who don't understand the technical details. This attitude fits ill with democracy.

Nuclear fission is scientifically understood, and we have the technology based on that science - nuclear power reactors - commercially mature. Electricity from nuclear power stations will be reliable, clean, and so cheap we often won't bother to meter it. Not one reputable scientist disputes these claims by the enthusiasts for this modern, hi-tech wonder technology.

Such euphoric claims went practically unchallenged for as long as a decade from the late 1950s. Then in the late 1960s a few scientists began to tell

the public that nuclear reactors could devastate areas about the size of our island, and that even if nothing goes wrong at the reactor the spent fuel poses grave hazards. Fortunately for our little country, other sources of electricity (hydro and geothermal) were obviously cheaper so that it was not until the 1960s that our government's nuclear power programme began. The same New Zealand bureaucrats who in 1966 proudly paraded foreign experts planning a nuclear station at Baring Head (12 miles from Parliament) were by 1974 bitterly defensive when the Campaign for Non-nuclear Futures - a terminating *ad hoc* coalition - got going. By 1979 a Royal Commission had laid the programme gently to rest; nobody respectable has tried to revive it.
But let us never forget that several hundred nuclear power reactors were foisted on the world, and many thousands of people doomed by the 1986 Chernobyl accident, as a result of that disgraceful decade when sheer lack of interest among scientists, suppression of the few critics, and stunting of alternatives, left the public crucially ignorant.

I need hardly add that the media almost entirely failed to reveal any significant facts about the hazards of nuclear power, at least until the late 1970s. Today the media are failing in their duty, far more culpably in that they can easily find out the arguments for increased caution on GM but are nearly all too lazy &/or too craven to do so. The best website is www.psrast.org.

Today the smug status of genetic engineering eerily recalls that period in the early 1960s when nuclear reactors were "commercialised" on the basis of enthusiasts' claims of understanding & control. New ranks of enthusiastic experts now tell us there's no significant threat from artificial gene transfers: no great harm could result, and any minor mishaps are (they claim) so unlikely that you can forget these hypothetical notions. "The hazards imagined in the mid-'70s have turned out to be unreal" is a typical recent expert quote.

Alongside airy dismissal of the dangers, the promised benefits are wildly exaggerated - for example, millions of venture-capital dollars have been procured by claims of imminent production of "pharmaceutical proteins" which in truth are nowhere near medical use and can in one case be already obtained free! The actual list of real benefits from GE organisms is very short, after a quarter-century of 'jam tomorrow' hype thru the media. In our parliament MPs have given lists of what they believed to be actual accomplishments of GE which are however still not real. [I have upbraided Rt. Hon. S. Upton in person for this.]

The Doubts

Many scientific and moral leaders have queried GE. The science upon which GM technology is founded - neo-Darwinism and the 'master molekule' idol status for DNA - are under strenuous criticism from scientific thinkers. Genes are not Lego modules which can be blithely slotted into very different organisms free from unintended effects. Rogue diseases are a genuine concern arising from detailed, sceptical appraisal of some GE projects. But global ecological damage is the gravest threat.

One tawdry old argument we have heard since 1974 and can expect to hear again in all its flagrant deceit is the claim that gene transfers occur naturally and so GM is only hastening them. This line of talk is a smoke-screen designed to obscure the fact that GM usually performs artificial transfers which are **not** believed to occur in nature. This fact is denied when possible harm is suggested, but is acknowledged, indeed emphasised, for claims of benefit.

If we change the rates, or even worse the specificities, with which genes can jump around in infectious manners, we may wreak biological havoc on a global scale. Go back to Ovid's *Metamorphoses* to glimpse what might go wrong.

But the gene-jockeys claim they can, godlike, foresee the evolutionary results of their artificial transposings of human genes into sheep, bovine genes into tomatoes, etc. This is extreme, deluded arrogance; for the theologically inclined, I recommend one chapter: *Genesis 3*.

The science these gamblers hawk is, on several levels, junk. I haven't space here to detail this contention, only to mention a few aspects of their junkiness.

* Gene-jockeys often work on the assumption there are only 4 letters in the 'alphabet' of DNA (called for short G, C, T, and A); for example, "DNA is a very long molecule built of only 4 letters" - Dr Andy Shenk, Genesis R&D Corp (Auckland, N.Z.) TV1 'Holmes' show 00-6-27, and Prof Ros Macintosh of Massey U, TV1 this Monday. But it has been known for several decades that other 'letters' exist in DNA. The functions of the 'odd' bases - methyl-C, methyl-G, and others - are largely unknown, but that does not mean they're equivalent to 'The Big Four'. They are often ignored by genetic engineers sequencing DNA "copied" by systems that produce only 'Big 4' polymers. This is junk science.

* They pretend that the effects of genes inserted by radically unnatural methods are predictable, when they are known to be extremely variable (usually lethal).

* They pretend that a cell surviving such genes-insertion processes, and then selected on just one property - resistance to an antibiotic - and then grown into a whole organism, *e.g.* a potato, will have all properties at least as good as those of a normal organism.

Never since the Nazi attempts to legitimize racism has science been so rapidly & severely degraded. Apologists for GM posing as defenders of true science - *e.g.* ACT - are taking up an untenable, indeed ludicrous, stance.

The Commerce

Doubts have been swept aside by the thrust of transnational corporations funding university and 'crown' GM labs, as well as small groups of academics starting GE firms (a far cheaper image to erect than that of a nuclear reactor manufacturer).

A further subtle commercial lure is the relative difficulty of tracing the offender when the 'one in a million' mishap occurs. The Swedes in April 1986 only briefly thought the unusual radioactivity in one of their nuclear stations was from another of their own - it was traced to Chernobyl within days; but if an epidemic of this or that disease breaks out amongst cows or humans in the Hamilton district, the fact that the nearby government research station at Ruakura has been largely given over to GM for foreign purchasers will not suffice to sheet home any blame. Any ensuing inquiry would elicit much closing of ranks as most of the scientists able to understand such arcane matters covered up for each other. Ronald Reagan's favourite criterion - deniability - is all too easily arranged in the GM business.

How Much Harm; How Often?

In appraising dangerous technologies, it is best to estimate the **hazard** - the scale of harm in the event of a major mishap - as a separate question, and then analyse if possible the **risk** - the probability that the major mishap will occur. Much confusion between these two aspects of danger has been created by language-tampering, even in such formal arenas as the *Journal of Risk Analysis*. Some ERMA staff are trying to organise a pseudo-professional club on Risk Assessment to feed them what they want to hear for their purpose of rubber-stamping; they did not invite any sceptical speaker for their Dec 13 2000 inaugural meeting.

The hazards of GM rival even nuclear war. Biology is so much more complex than technology that we should not pretend we can imagine all the horror scenarios, but it is suspected that some artificial genetic manipulations create the potential to derange the biosphere for longer than any civilisation could survive. If only enthusiasts are consulted in appraisal of GE proposals, such scenarios will not be thought of.

The nuclear parallel is again cogent. Not until the AEC's 'Rasmussen/Levine' report of 1974 were sceptical analysts such as Kendall and Lovins asked for their opinions (and then they were ignored).

The hazard certainly includes some mortality: dozens of people were killed in the 1980s by impurities in L-tryptophan (a natural amino acid, sold as a 'dietary supplement' to avoid medicine regulations) made by Showa Denko using GE'd bacterial cultures. By early 1991, Showa Denko had paid $4.6M in out-of-court settlements amongst lawsuits for over $810M. By now, the totals are roughly U$2,000,000,000 and 80 - 120 deaths, possibly more. Thousands continue maimed. This actual damage by GE <http://www.connectotel.com/gmfood/trypto.html> is one basis of the campaign for labelling as such any GE'd foods which may be permitted.

Eating a certain GE potato damaged internal organs of rats in the pioneering test of GE food by Dr Pusztai. He was vilified and sacked.

Damage to non-human organisms is a real concern. Monarch-butterfly caterpillars eating leaves dusted with a GM-maize pollen were - nearly 50% - killed, and the survivors stunted, compared with the identical experiment using ordinary maize pollen.

The role of emotion is often misrepresented by enthusiasts for dangerous technologies. They decry as 'emotive' any argument or fact inconvenient to their cause, but their own enthusiasm does not count as undesirable emotion; indeed they pretend to be 'objective' - devoid of emotion - when in fact they're ruled by emotion, against reason.

A spectacular double standard prevails: benefits of GE are stated as fact when they are no more than fantasies, *e.g.* AAT treating emphysema,

[PPL Ltd have continued this furphy, unchallenged by the media, only admitting last year that their thousands of transgenic sheep near Whakamaru are a flop. The company has now gone bust. ERMA failed to require autopsies.] whereas any suggestion of harm is ruthlessly rejected, usually by personal vilifications and always by an ultra-stringent standard, *e.g*. the outrageous purging of Dr Pusztai.

Professor Peter Bergquist coined the term 'the Liberia of GM' in the mid-70s as he feared NZ would be used by foreign gene-technologists for experiments that wouldn't be permitted in their homeland. He assessed the benefits and the hazards at that early stage as "equally speculative". The experiments in the intervening quarter-century have revealed some actual harm; many potential forms of damage have been pointed out, but the gamblers roar on cheerfully; and the benefits - from crops and animals, as distinct from contained microbial cultures - remain speculative (except for Monsanto who sell the cloned seeds resistant to their main herbicide Roundup® and also sell some seeds for crops containing modified Bt insecticide). No benefit to farmers has yet been shown. The yields of RoundupReady® soybeans are 4 -7% lower than those from proper soybeans, except in drought districts where the GE yield is 30% lower. Monsanto's NuLeaf® Bt-potato reached 5% of the USA potato crop but already sales are dropping [and now the brand has been withdrawn from sale]. One of the most respected science reporters, Nicholas Wade, pointed out in the *New York Times* recently that almost all GM corporations have yet to win a cent of revenue, let alone net a profit.

Law

In 1977 the N.Z. Association of Scientists proposed a moratorium on GE pending a full public inquiry. This policy was taken up then, two decades ago, by a few politicians. But the genetic engineers had one or two rabid advocates in Parliament, notably Jim Sutton's brother Bill, and avoided hostile scrutiny. Only now, two decades later, the Royal Commission has been formed; but how much GM can proceed during its inquiry remains to be determined. [new permits for field trials were suspended during the RCGM's proceedings. Pre-existing trials were allowed to continue. Special legislation was passed to allow release of GMOs; but none has yet been legally permitted in NZ.]

At last, a form of legal regulation of novel organisms emerged - the ERMA. In its first 22 field-trial decisions, ERMA has issued 22 approvals. This is a biased, secretive, even obstructive agency, which collects a lot of money from both the

gene-jockeys and the government to maintain an expensive rubber-stamp. It is chaired by Mr W J Falconer, a main pusher of the Mobil/Bechtel synfuels factory (at Motunui) which has not made any petrol for several years and was always an inferior plan. Several other members have no obvious qualification. It was National Party cronyism at its worst, and these stooges may go on issuing legal permits while the Royal Commission examines for the first time which GM experiments should be permitted. The problem with the gene pool is that there is no lifeguard. [ERMA has continued unsatisfactory; some scathing criticisms by G Nahkies' cttee have evoked no clear progress.]

Having taught on environmental health hazards for many years in science & medical faculties, and having served as an adviser to successive Ministers of Health in the first dozen years of the Toxic Substances Board, I know all too well how overloaded government staff, even when backed by statutory powers, get subverted by not only the specific claims but more importantly the whole value-system of the industries which they are supposed to regulate. The imbalance is particularly severe for such pathetic pretences as have been staged to regulate GE. A pro-GM ERMA staff member has been transferred to the Royal Commission staff; she should be removed. [this operative did go back to ERMA, but not before a lot of harm had been done.]

Laboratory experiments have been approved by local safety committees wielding legal powers completely delegated by the ERMA which however still collects a hefty fee. Over a hundred such GM experiments have been exposed as illegal. No penalties are proposed. [RCGM recommendation 6.2, for a review of the containment systems, has been ignored by the Clark regime.] Misuse of the legal system for such a pseudo-regulatory charade undermines the rule of law. Little wonder then that direct action has been resorted to, in Britain, the USA, and here, to uproot experimental GM crops.

GE and the Dairy Industry

What then of the "multi-billion dollar new life science industry for the region" alleged by Keith Steele and Neil Richardson ?

The NZ Dairy Board declared its intention to pour $150M into GM experiments over the coming 5y. They said they were spending $60M/y on R&D and GM is taking $30M/y extra. [Media fail to report on the corporations *e.g*. Gluckman's ViaLactia® that procured dozens of millions of this budget for dairy-GM after

the Dairy Board was abolished. Main proximal procurer Kevin Marshall is down the road.]

You can reasonably assume that most of the $42B/y mirage projected for the NZ dairy industry relies on GE fantasies which are far from reality and may never be feasible let alone profitable. It is not extremely safe to assume they would all gain legal permission, after the Royal Commission on GM has performed the first sceptical investigation, by public hearings. There have been many flops in GM. Let me give a few examples of how dairy GE can go wrong.

A relatively early example was the mid-1990s attempt to make a human protein in goats' milk by Lincoln University biochemistry professor Bullock, funded by Genzyme Corp of Framingham, Massachusetts. This case came & went entirely within the never-never period when no legal regulatory regime existed in our country but Prof Petersen of Otago presided over a pseudo-regulatory Interim Assessment Group (IAG) administered by the Ministry for the Environment. The project was to raise and study a herd of goats GEd to contain in their milk the human protein CFTR - cystic fibrosis transmembrane-conductance regulator. The professor's formal proposal was written, and ancillary mass-media propaganda was slanted, so as to create the impression that the Genzyme/Lincoln work is based on some scientific hypothesis which could well lead to therapy for cystic fibrosis. This is a misleading impression. Even if it proves feasible to insert the gene for the human lung protein CFTR into goat embryos or zygotes, leading to goats' milk containing significant quantities of human CFTR, there will still remain the difficulty that no therapy is in prospect using any concentrated preparation of CFTR. The proposal's phrase "the drug produced" was therefore false and deceptive.

The leading medical experts on cystic fibrosis have found themselves in the unpleasant role of breaking the news to the parents of CF sufferers that, contrary to the Genzyme/Bullock/*NZ Herald* image, no therapy is in prospect. It is cruel to raise hopes which must thus be dashed by others.

The public should also learn that permission was denied for Prof Bullock's conjoint proposal to produce similarly in goats' milk a second human protein, AAT, which has even less prospect of utility or market value but which he termed a "pharmaceutical protein" - of which more soon. The IAG, to its credit, recommended against the inclusion of AAT in this CFTR caper.

The results, reported in a couple of sentences by the Ministry for the Environment, were a complete flop, the goats were destroyed, what was done with their remains is unclear, and Prof. Bullock went overseas.

Which media were not too lazy or too craven to report this caper?

A more important and interesting example is the current attempt to genetically engineer that human protein called AAT in N.Z. sheep. A small Scottish company ("Pharmaceutical" Proteins Ltd - the 'Dolly' procreators & impresarios - financed by the large German multi-national Bayer) wanted to field-test in New Zealand ewes GE'd to make in their milk a human protein called by the unhelpful name alpha-1 antitrypsin (abbreviated AAT). The only reason stated for doing such experiments in N.Z. was this country's scrapie-free status. The Ministry for the Environment's Interim Assessment Group (IAG), although devoid of experts on prions (scrapie, mad cow disease, CJD, etc.) and dominated by GE enthusiasts who appear to think that fears of GE are absurd, advised their Minister to refuse - which he did. Reasons, when reluctantly disclosed, turned out to be mere econobabble; prions were not mentioned.

Prevalent misinformation tending to favour the AAT project, due partly to an anonymous 'news' report in *Science* , requires correction in at least the following respects.

(a) AAT-deficiency is equated with congenital emphysema, an unjustified jump beyond the evidence. Most of those born AAT-deficient do not develop lung disorders. Reports on N.Z. TV and in newspapers have credited AAT as a treatment for emphysema; the public would take this to mean the common smoking-induced illness, greatly exaggerating the claim of usefulness. The congenital version is very much rarer, if a proper diagnostic category at all.

(b) AAT is asserted to be in use now to treat congenital emphysema, whereas such crude preliminary trials as have been done prove very little. In fact there exists no use, let alone a market, for genuine human AAT which is routinely purified as a by-product and discarded in standard blood-bank fractionations of pooled human plasma.

(c) AAT is implied to be very valuable ("U$100,000/y per ewe"), which factoid is then used to justify attempted production by genetic engineering. All this "future earnings" is intended to stimulate a stock-market ramp before

anything saleable has actually been produced. That at least is the intention. But of course such a bubble must burst after enough time without selling anything. This is the fate of nearly all such capers.

The then Minister 'for' the Environment, ex-Rhodes Scholar & lawyer Mr Simon Upton, solicited a modified application, which was approved - on economic grounds.

Then the ERMA, flying in the face of the facts, approved expansion of PPL's flock to 10,000. Nothing was to go offsite except the milk (for processing by a Tainui enterprise in Hamilton). But then, the ERMA has never rejected a GE field trial. It stages some dramatic delays - on that, I sympathise with applicants.

This PPL caper is only one of many similar. The standards of truthfulness in the GE trade are reminiscent of those prevailing in the computer trade, with which it has intimate links.

That is the context in which the AgResearch® Ruakura group l'Huillier, Wells *et al*. claim they might make a cow whose milk could simply be drunk to treat the demyelinating illness **multiple sclerosis**. There is *some* evidence this might work; but it could go badly wrong, in the people and perhaps in the cows. Demyelination can be **induced** by injecting the protein in question, and we know little about what it will do by mouth. The more likely motive for this project is to get patents on new cloning techniques, as have been issued to the 'Dolly' impresarios. The *Waikato Times* bills these enthusiasts as 'The Geniuses'. Most cloned mammals to date have aged prematurely and died young, so there's room for improvement in the exactitude of these "exact" copies.

Phil l'Huillier had a go at me in public so I asked him whether he really believed the milk he plans is likely to help MS sufferers. His answer was only that he HOPED it would.

We haven't time today to discuss GM-trees, for which a main world research centre is the corporation called Genesis® in Parnell. Also I must largely leave you to read up on GM-crops, which are the main GE organisms outside containment - mainly in N. Amer. and Argentina. One practitioner of

GM-plants, Prof Patrick Brown, has expressed severe misgivings about the current versions, on the PSRAST website.

The depraved trade of mercenary deception, commonly called PR, has enormous influence in the suppression and distortion of information about GM. This has been feasible largely because the NZ media have almost totally failed to tell key facts about GM. The *NZ Herald*'s Yoke Har Lee, for instance, largely just laundered PR claims from the gene-jockeys, with no balancing comment from critics. Radio NZ's 'Eureka' operatives Alan Coukell & Veronika Meduna have promoted GM by very uncritical biased reporting.

Global Reach

Government, gutted & starved by the ideological hatred of public enterprise (Rogernomics, Ruthanasia, and then Jenocide - our versions of Thatcherism), is largely warped to the commercial service of foreign corporations, and is almost totally unable, so far, to regulate GE. The charade of pseudoregulation - the expensive rubber stamp called ERMA, and the even less regulatory ANZFA - fails to control anything much, even labels. [A 'Food Standards Authority' dominated by Australia appears to represent no progress.]

GE Products

A few biochemicals are being made commercially by GM in microbes. One which looms over New Zealand is recombinant bovine growth hormone, also known as bovine somatotropin. Canada rejected this, mainly because it is cruel to the cows. But there are other drawbacks.

I excerpt from a recent summary by Samuel S. Epstein M.D., Professor of Environmental Medicine, University of Illinois School of Public Health:

The GM milk hormone, rBST, is exclusively manufactured in Austria by Biochemie Kundl, a Novartis plant under license to Monsanto; in 1998, over 100 million doses of the GM hormone were exported to the U.S. and also to 16 Third World Countries. While the administration of rBST to cows in Europe was banned (very recently) on unarguable animal health and welfare grounds, there are no restrictions yet on the import of GM dairy products, nor any requirements for their being labelled GM. GM milk, produced by injecting cows with the hormone rBST, is qualitatively and quantitatively different from natural milk. These differences include:
contamination of milk by the GM hormone rBST;

contamination by pus and antibiotics resulting from the high incidence of mastitis in rBST injected cows;
contamination with illegal antibiotics and drugs used to treat mastitis and other rBST-induced disease;
increased concentration of the thyroid hormone enzyme thyroxin-5'-monodeiodinase;
increased concentration of long-chain and decreased concentration of short-chain fatty acids;
reduction in casein levels;
and major excess levels of Insulin-like Growth Factor, IGF-1, including its highly potent variant, in the milk and, surprisingly, in the blood of people who drink it. IGF-1 is under strong suspicion of causing cancer, notably breast and prostate.

Monsanto have tried to register their Posilac® rBGH in this country, but late in 2002 the impression emerged that this had been rejected. Its exact legal status could be usefully clarified by a good law student.

Wake Up!

It is now a quarter-century since genetic engineering was identified in the same league as nuclear weapons among major threats to the biosphere. During this period, market forces have prevailed instead of informed democracy.

Genetic engineering is by now more popular - more widely practised - than dangerous versions of nuclear science ever were. But it is in general an imprudent gamble and profoundly wrong.

Corruption of scientific institutions is one of the offences of this gene-tampering fad. The Royal Society of NZ was manipulated by the then president of the NZ PR Institute, Ms Norrie Simmons, in her private trust GenePool, funded partly by Monsanto - a front for the GE trade, touring Dr Richard Bellamy & Professor Sir John Scott to say there's little to worry about. GenePool also maintained an extremely biased website claiming benefits of GM but minimising hazards. Has science ever been so warped by PR? [Simmons features prominently in the corruption documented by Hager in his book on GM corn permitted by Hobbs/Clark. She issued gagging writs on Jeanette Fitzsimons list-MP and RadioNZ for reporting her role in the King Salmon field trial PR. Why have years passed while that phoney suit has not been brought on for trial?]

Biologists are being purged from our universities to make room for gene-manipulators expected to bring in venture capital. The head of the Massey University black suit gang stated in writing and on TV that his "repositioning" is to promote computing and gene-tampering. This is being done by purging proper academics. Some of his darling gene-tamperers have been promoting GM with false claims. [He has now moved back overseas.]

Misallocation of money, and more importantly of scientific talent seduced by GM, are among the reasons why the duty to care for natural ecosystems is so disgracefully neglected. Greedy nerds applying the hacker mentality to life itself is the ultimate decadent technomania. The prostitution of science is most complete and most dangerous in the selfish commercial gene. When will we muster the ethical power to wake up from this sleepwalking?

How much GE should be allowed to continue during the public inquiry?
I suggest
1 do not permit new field trials
2 shut down existing field trials
3 review laboratory GE precautions
4 of course, receive no applications for release of any GM organisms
5 abolish Gluckman's "Independent" Biotechnology Advisory Council which was set up by the previous government with several gung-ho GM advocates but no known scientific critic. [this Maurice Williamson brainchild was quietly allowed to die, without any condemnation for its uselessness & bias. It has been approximately replaced by new biased qangos.]

What To Do Instead of GE

We did not just campaign against nuclear power. People want to know what to do instead. The Campaign for Non-nuclear Futures took every opportunity to point out better technology & ideas.

Instead of GE, and agribusiness more generally, the only real hope for feeding the world is organic agriculture - as advocated & practised by Prince Charles. If we can do it with apples, as is being achieved very profitably in NZ now, we can do it much more generally. The lower costs more than compensate for the cases of slightly lower yields; in general the yields of organic gardening are several times those achieved in agribusiness.

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The best website on GE is:
http://www.gmwatch.org

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Dr Mann was Senior Lecturer in Biochemistry in the University of Auckland and then became its first (and last) Senior Lecturer in Environmental Studies. In retirement he works mainly on solar-thermal and motorcycling inventions, as well as helping to bring recombinant DNA under control.

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