

Reprints

The Science Wars

Volume 2

Civil Actions

**Mae-Wan Ho
Angela Ryan
Nick Papadimitriou
& Others**

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(This article was written on the occasion of MWH's invited participation in the International Seminar on Biodiversity organised by Brazil's judiciary)

News from Brasil 17.5.99

Biosafety, Patents and Biopiracy

Mae-Wan Ho

A record 1200 turned up for the International Seminar on Biodiversity Law held in the auditorium of the Superior Court in Brasilia 11 to 14 May, 1999. The seminar was organised jointly by the President of the Centre for Judiciary Studies, Antonio de Padua Riberio and the Director of the General Coordinating Office of Federal Justice, Fontes De Alencar, who is also the regional judge of Rio Grande do Sul, and was opened by the vice-President of the Republic. The participants included a large number of distinguished federal and state judges. Others present were indigenous peoples' leaders, civil servants, activists, staff of foreign embassies, students and scientists. The organizers had expected 50 to 100. Instead, the auditorium of 800 capacity was filled, and an overflow audience sat outside the hall with televised coverage. Gisela De Alencar, legal consultant on environmental law to the House of Representatives and one of the organisers of the event was "astonished and delighted" at the large turnout.

The most topical area of discussion was biotechnology, especially over patents on seeds, biopiracy and biosafety. The seminar happens to coincide with a series of battles over field trials and commercial approval of Monsanto's transgenic soya by the heavily pro-biotech National Technical Committee on Biosafety. This has pitched state governments against the federal government, and different departments of the federal government find themselves in opposition. A consortium consisting of the federal Environment Protection Agency, Greenpeace and the Consumer Defence Institute are locked in a legal battle against the National Technical Committee on Biosafety in partnership with Monsanto. The federal court has decided to approve Monsanto's transgenic soya bean for commercial release but requires Monsanto to segregate and label the produce. However, Monsanto is trying to overturn this requirement with the help of the National Technical Committee on Biosafety. Feelings ran very high over this issue.

The State of Rio Grande do Sul has led the revolt by banning Monsanto's transgenic soya from being planted. Just before the seminar, all 27 states of the Republic voted unanimously for a moratorium until environmental impact studies have been done. Jurist Paulo Affonso Leme Machado, President of the Brazilian Society of Environmental Law said, "it is incumbent on the federal government to prove its action is not harmful to the environment. The federal government must abide by the decision of the states to require environmental impact studies before approving commercial release."

According to David Hathaway, an economist of The Consultancy and Services in Agricultural Projects and Techniques, Monsanto has bought up 60% of all the seed companies in Brazil in a space of two years. It now has some 700 undisclosed test sites for transgenic crops. This has incensed indigenous farmers all over the country, both because of the threat of seed monopoly and the adverse impacts on biodiversity.

Mae-Wan Ho, geneticist and biophysicist from the Open University and scientific advisor to the Third World Network, exposed the myth that transgenic agriculture is needed to feed the world. "The intensification of corporate monopoly on food is going to cause famine. It also diverts us from implementing the sustainable, organic agriculture that can truly guarantee food security and improvement of health for all." She also reviewed the scientific evidence pointing to the dangers of a technology "that has the potential to destroy all life on earth", especially when it is being misguided by a discredited, reductionist science that has little or no contact with reality.

Biopiracy is another burning issue. Gurdial Nijar, legal consultant of the Third World Network, pointed out that "indigenous knowledge has fed, clothed and healed the world for millenia". The concept of patenting and owning life is antithetical to all culture in the Third World. Furthermore, it denies the "cumulative innovative genius" of farmers over the generations. (The same argument actually applies to a lot of patents on genes and cell lines - it denies the cumulative innovations of generations of scientists who have worked hard to gain the knowledge involved.) Marina Silva, Senator of the Federal Government and well-known champion for indigenous rights, spoke passionately of the need to protect local communities and the inextricable link between human and natural biodiversity. This is reinforced by Clovis Wapixana, Indian Leader of the Indian-Affair council of Roraima, who drew attention to the extensive, deep knowledge of indigenous plants and animals possessed by the Amazonian Indians which alone can sustain natural biodiversity. One big problem is expropriation of land by corporations. Predatory fishing, logging and poisoning of rivers by prospectors happen on a daily basis, but the state has not intervened. Now to top the insult, bioprospectors are expropriating their knowledge.

A notorious case involves an ethnobotanist from Oxford University, Conrad Gorinsky, who has patented the extracts of two plants *bibiru* (used as contraceptive) and *cunani* (used as anaesthetic and as fish poison) from the North of Brazil. When asked by journalist Mario Cesar Carvalho whether he knew he was contravening the Convention of Biological Diversity which stipulates that there should be equitable benefit sharing, Gorinsky is reported to have laughed and said, "Why should I share royalties with Brazilians?"

Even more scandalous is the fact that a US company, Coryll Cell Repositories lists Amazonian Indian blood cells in a DNA kit priced at \$500. This is openly advertised on the internet.

Actually, biopiracy is not new. Adalberto Carim Antonio, Judge of the State of Amazonas, points out that 70 000 seeds were taken by Harry Wickham on behalf of the Kew Gardens in Britain. Wickham was subsequently knighted for his efforts, but this act plunged the state of Amazonas into poverty for 50 years.

When is the Brazilian Government going to register indigenous knowledge to prevent patenting? Is the mere act of registering indigenous knowledge going to encourage biopiracy? There is no control over tourists stealing seeds or rare species of animals being exported.

Sign on to our statements on global moratorium on releases and ban on patents!

ISIS News 3, December 1999, ISSN: 1474-1547 (print), ISSN: 1474-1814 (online)

From Seattle to MontrealWorld Scientists Calling for GM Moratorium Swell to Over 230

Seattle was a truly inspiring event for the global civil society, every sector was represented from all over the world: labour, family farmers, indigenous peoples, professionals, consumer organisations, citizen action groups, environmentalists. Suddenly, everyone realizes we are all struggling against the same thing: corporate rule under a globalised economy that has created massive poverty and brought the earth to the edge of extinction. And still, our governments in the industrialized North are bent on negotiating agreements behind closed doors at the WTO that will effectively sacrifice environmental protection, labour and safety standards, and even basic human rights to trade and financial imperatives.

Fortunately for everyone, governments from the Third World and other non-industrialized countries have united to say a resounding 'No!' on our behalf. Our Open Letter from World Scientists to All Governments, calling for a GM moratorium, a ban on biopatents and a public enquiry into the future of food security (see ISIS website) was successfully delivered to the Heads of Delegation to the WTO, thanks to the Third World Network. In the event, 144 scientists from 27 countries were included.

Our letter was particularly timely as Canada and Japan proposed to set up a Biotechnology Working Group in the WTO to deal with GMOs and biotechnology, while the United States called for improvements to rules and disciplines of the WTO to ensure that trade in agricultural biotechnology products is based on "transparent, predictable and timely processes". The aim of the proposals, as pointed out by Mathew Stilwell of the Center for International Environmental Law and Martin Khor of the Third World Network, is to limit the ability of importing countries to regulate GM products and to subordinate the International Biosafety Protocol, currently being negotiated under the Convention on Biological Diversity, to the WTO. The proposals were a blatant attempt to undermine the Biosafety Protocol and to force trade of GMOs in the face of serious threats to health and biodiversity. They were strongly opposed by the like-minded group which included the African region, the Caribbean and most countries in the Third World.

In the event, an estimated 35 000 to 50 000 took part in peaceful demonstrations in the city. Yes, it was overwhelmingly peaceful despite aggressive tear-gassing, pepper sprays, rubber bullets and other tactics employed by the Seattle police, and a few shop windows broken as a consequence. Michael Meacher, UK Minister for the Environment, gave an accurate account in his diary for the *Independent on Sunday*, and definitely blames the Seattle police. The police chief has resigned amid calls for a public enquiry.

The official WTO negotiations collapsed – to great jubilation in the streets - after the government delegations of the developing nations united in protesting against the lack of transparency and democracy in the proceedings. The rich industrialized nations again tried to impose their corporate agenda on the poor countries, and failed. It was a decisive victory for the developing countries and for all citizens of civil society in their collective struggles against corporate feudalism.

But, beware of the next round: the up-coming Biosafety Protocol meeting in Montreal, starting 25 January 2000, when GMOs and products thereof will take centre stage. We shall be submitting our letter to the official delegations there. Since Seattle, the number of scientists who

have signed on has jumped to over 230, thanks to Jaan Surkuula, Director of Physicians and Scientists for Responsible Assessment of Science and Technology (PSRAST) and signatories to their statement who have joined forces with us, plus others who have signed on independently. Please help collect more signatures for Montreal! It will be a very crucial meeting, and we must make sure that the arguments of real scientists who adopt the ecological perspective and the precautionary approach are heard loud and clear.

At least ten scientists on our list were active in Seattle, in the teach-ins, workshops as well as the street demonstrations (none got arrested, fortunately): Dr. Phil Bereano of Council for Responsible Genetics USA; Dr. Tewolde Egziabher of Ministry of the Environment, Ethiopia and Spokesperson for the African Region and Like-minded Group on Biosafety; Dr. Michael Fox of Council for Responsible Genetics USA; Dr. Mae-Wan Ho of ISIS and Open University UK; Dr. Jonathan King, Molecular Biologist, MIT, USA; Dr. Peter M. Rosset of Institute for Food and Development Policy, USA; Devinder Sharma of Forum for Biotechnology and Food Security India; Dr. Vandana Shiva, Research Foundation for Science and Ecology India; Dr. David Suzuki of the Suzuki Foundation and University of British Columbia Canada; and Dr. Christine von Weisaeker, Ecoropa Germany.

MWH

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ISIS Condemns Naked Corporate Propaganda “The Rise and Fall of GM Food”

Channel 4 TV Equinox, March 20, 2000

As part of the pro-GM offensive, TV Channel 4 Equinox, a science series commissioned a programme and tricked me into taking part in it. Their researcher told me it was going to air the scientific debate properly. Instead, it turned out to be a calculated attack on me and the anti-GM movement, and a naked propaganda for the biotech industry. It contains all the misinformation and disinformation that proponents have been perpetrating for years, plus a manipulative juxtaposition of images and narratives to create, at best, ‘modified truth’, which is appropriately the original title for the programme.

What I did not know, was that the producer is Martin Durkin, who was responsible, last May, for an Equinox programme which claimed breast silicone implants reduced the incidence of breast cancer, dismissing women who complained of serious health problems as cranks, malingerers and compensation-chasers.

In 1997, Martin Durkin made a series, Against Nature, for Channel 4, which compared environmentalists like George Monbiot to Nazis, accusing them of conspiring against the world’s poor (see Monbiot’s article, “Getting your science from charlatans”, The Guardian, Thursday, March 16, 2000). The Independent Television Commission’s verdict on the series was that the programme makers “distorted by selective editing” the views of the interviewees and “misled” them about the “content and purpose of the programmes when they agreed to take part.” That was exactly what happened to me.

The main message the present programme conveys is that GM food is perfectly safe and beneficial and badly needed to feed the hungry in the Third World. But hysterical environmentalists and the privileged, chattering middle-classes (mainly women) have been responsible for bringing down the industry.

What offended me most was not the attacks on my position, but the programme’s exploitation of the poor and starving in the Third World. Scenes of sick, starving children and subsistence farmers in Africa alternated with women from the Women against GMO Campaign lunching around a table or shopping for organic food. Dr. Tewolde Egziabher, spokesperson on biotechnology for the whole of the African Region, has already roundly condemned the use of images of starving African children to promote the technology which is of no benefit to the poor in African countries, nor is it safe nor environmentally sound.

The programme was also intent on attacking organic farming. It opened with the scene of a scientist in Cuba being honored as the father of biotechnology, but failed to mention that the recent major success in Cuban agriculture is the pioneering of integrated organic farming. This has managed to increase food production and to wean the country largely from agrochemicals (see Cultivating Havana: Urban Agriculture and Food Security in the Years of Crisis by Catherine Murphy, Food First Development Report no. 12, May 1999). Helen Browning of the Soil Association, one of the women of the Women against GMO filmed feasting around a table, is actually a successful organic farmer in the UK with 3000 acres. No, she was not interviewed on organic farming either.

I took part in a followup debate broadcast at ten past midnight, 22 March, where I began by dissociating myself from the Equinox programme. Gratifyingly, there was a flood of letters of complaint both to Channel 4 and to the Independent Broadcasting Commission. We shall be compiling the excellent comments to post on our website. MWH

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Warnings that GM Crops are Unsafe

ISIS Arrange Special House of Commons Briefings Feb. 10-11, 2000

By special arrangement with Alan Simpson MP, ISIS brought two expert witnesses before the UK Government, to warn of the hazards of GM food and crops, and of the bureaucratic cover up that occurred in the early 1990s when GM foods were first approved by the US Food and Drug Administration (FDA). Professor Terje Traavik, virologist and senior scientific advisor to the Norwegian Government, and Steven Druker, lawyer spearheading the civil lawsuit against the US FDA, gave a private briefing to UK Environment Minister Michael Meacher and his scientific staff in the Department of the Environment, Transport and Regions (DETR). This was followed, on the next day, by a public briefing for politicians and the press in the House of Commons.

During the private meeting with Meacher, Prof. Traavik did not mince his words. He warned that the first generation of GM crops are dangerous for human health and the environment, and should be banned. The second generation of GM crops will avoid some of the hazards, and may offer the way forward. Adequate risk assessment was impossible because so little research had been done to even characterize the potential risks involved. He emphasized that the precautionary principle must be used to deal with the terrible mess that biotech companies had made by forcing such a potentially hazardous new food science onto the world.

Steven Druker told of how the US FDA had misrepresented and concealed the scientific advice it received from its own scientists. Internal documents, obtained as the result of the civil lawsuit, show how the FDA had ignored repeated warnings that GM foods are not substantially equivalent to conventional foods and involve new risks. He explained that the first GM food approved in the US, the Flavr Savr tomato, actually failed to pass the FDA's required toxicological feeding trials, and this matter was never resolved by the agency. Instead, FDA eliminated the requirement for feeding trials, and proceeded to approve GM foods on grounds that they were GRAS, generally recognized as safe. FDA scientists were also vigorously opposed to the use of antibiotic resistance marker genes in GM foods and animal feed, on grounds of risks to human and animal health. FDA ignored this advice as well.

Michael Meacher and his staff were reported to be very interested in the presentations and 'alarmed' by the legal challenge now under way in the US. The meeting ran over time by half an hour as the speakers were questioned in more detail. The Minister spoke extensively with Prof. Traavik and requested copies of all his reports to the Norwegian Government.

At the public briefing in the House of Commons the next day, Steven Druker repeated his message. He made clear that the FDA are in direct violation of US law, which clearly adopts the precautionary principle and mandates it in the Food, Drug and Cosmetic Act. The Act requires new food additives to be demonstrated safe before they are approved for market.

He quoted several FDA scientists, who strongly protested against the approach taken by the agency. "The agency is trying to fit a square peg into a round hole by trying to force an ultimate conclusion that there is no difference between foods modified by genetic engineering and foods modified by traditional breeding practices." wrote Dr. Linda Kahl, an FDA compliance officer. In summarizing the input from the FDA's scientists, she stated, "The processes of genetic engineering and traditional breeding are different, and according to the technical experts in the agency, they lead to different risks." Dr. James Maryanski, the FDA's biotechnology co-ordinator wrote in a letter to a Canadian official, "There is no consensus about the safety of GM foods in the scientific community at large, and FDA scientists advised they should undergo special testing, including toxicological tests."

Steven Druker said, "The FDA have totally misrepresented the scientific facts in order to promote the US biotech industry. The claim that its policy is science-based is completely contradicted by its own scientific experts and is therefore false and amounts to a major deception."

Prof. Traavik began by saying he is a professional genetic engineer and has been for the past 20 years. At first, he was a total 'believer' in thinking that there were only benefits. But he changed his mind as the result of discoveries made in his own laboratory. "We have no gene technology!" he said categorically, basically because the so-called technology is uncontrollable and unpredictable, so much so that there is no basis at all for risk assessment. Perhaps the next generation of technology may deserve the label. He emphasized that the gene constructs are the

same, and involve the same risks, whether they are used in agriculture or in medicine, such as gene therapy vectors and vaccines. Nature has never seen those sorts of genetic constructs before. They pose huge risks as they can become mixed up with normal viruses and other invasive elements and transfer their traits elsewhere. The potential hazards of artificial constructs are much greater than chemicals. Because, instead of breaking down or diluting out, they are taken up by cells to multiply mutate and recombine indefinitely. It may be “BSE [mad cow disease] in technicolor”.

The foreign genes and constructs cannot be targeted and are inserted at random, causing all sorts of genetic disruptions. These can result in the production of new toxins and allergens. All plants contain toxins and allergens but the toxins are produced at very low levels. GM can result in over-production of these toxins and allergens. He repeated his call for banning the first generation of GMOs.

Prof. Traavik also stressed the desperate need for public funding of risk associated research based on the holistic, ecological paradigm rather than the reductionist paradigm now ruling.

During the discussion, Prof. Arpad Pusztai, formerly from Rowett Institute, added that in his experiments (published in *The Lancet* last year), position effects due to random gene insertion were clearly observed. He worked on two lines of transgenic potato that were deemed to be substantially equivalent. However, after stringent analysis, they were shown to contain very different levels of protein and were certainly not substantially equivalent. The two lines came from one transformation experiment, but had very different compositional profiles.

One journalist questioned, “Surely not all scientists who support GM have got it so badly wrong?” Dr. Mae-Wan Ho replied from the floor that science was in crisis and funding in science is such that scientists are consciously or unconsciously adopting the corporate agenda, which is not the same as the public good.

Dr. Ian Gibson, Chair of the UK Government’s Science and Technology Committee, added that in his view, the whole process of safety assessment for all foods needed to be reviewed and updated.

The meeting was alive with questions from the floor and also ran over time. Reports have appeared in *The Express* and the *Daily Mail*, and Steven Druker gave at least two radio interviews to the BBC on the following day.

There was also a report that Steven Druker’s testimony had a major effect on UK prime minister Tony Blair, who was moved to a dramatic U-turn with regard to GM crops in admitting that they may damage both human health and biodiversity.

Steven Druker stayed on to attend the OECD’s intergovernmental meeting on safety in biotechnology in Edinburgh (reported by Dr. Pusztai, this issue). AR

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World Scientists Go Sustainable

World Scientists’ Open Letter welcomed by all except industry

World Scientists’ Open Letter was signed by more than 310 scientists from 38 countries when presented to the United Nations Convention on Sustainable Development (CSD), April 24 to 5 May 2000, New York. It was warmly welcomed and given much prominence in the official as well as unofficial proceedings because it speaks for the overwhelming majority of the participants and stakeholder groups. They share our concerns on the hazards of GMOs and strongly favour a moratorium on environmental releases. They are opposed to growing GM crops in developing countries, especially to patents on seeds and other life-forms and living processes, which threaten food security, sanction biopiracy of indigenous knowledge and genetic resources, and violate basic human rights and dignity. Most of all, there is a chorus of support for sustainable agriculture involving holistic approaches that integrate indigenous and western scientific knowledge and are adapted to local ecological conditions. Representatives of the G77 (the developing countries) and China repeatedly called for a holistic approach to sustainable development that is compatible with the diverse cultural traditions of countries within the group.

It was clear that industry and the industry-friendly governments of the Miami Group – US, Canada, Australia, Argentina, Uruguay and Chile – were isolated. Farmers across the developed and the developing world, indigenous peoples, trade unions, consumer groups, public interest organizations, the majority of government delegates and scientists (those not sitting with industry), were all speaking as with one voice.

Martin Khor, Director of Third World Network and Prof. Miguel Altieri, a well-known proponent of agroecology were invited to speak in the formal sessions, to much acclaim. Martin attacked the globalized economy for exacerbating the gap between the poor and the rich, as the superpowers

continue to legislate unsustainable and unfair treaties in the World Trade Organization that disadvantage the Third World; perpetrating neo-colonial exploitation and worsening the global ecological crisis. Miguel gave a detailed documentation of the successes of agroecology in Latin America and elsewhere, which have doubled and tripled yields within the past 10-15 years and reversing the social and environmental devastation of corporate agriculture. Among other contributors to the stakeholders dialogue were Dr. Peter Rosset of Food First Institute, Chee Yokeling and Victoria Corpus of Third World Network and myself from ISIS. Third World Network also organized workshops and a special seminar chaired by Colombian delegate Juan Mayr, the official Chair of the CSD session, who also chaired the Cartagena Biosafety Protocol meetings in Cartagena last year and in Montreal this January.

Thanks to Lim Li Lin of Third World Network, our Open Letter was subsequently presented to the UN Conference on Biological Diversity held in Nairobi later in May where some 60 countries signed the Cartagena Biosafety Protocol. The Letter was given prominent press coverage amidst calls for moratorium on releases of GMOs in Africa.

Prof. Oscar Zamora has reported earlier that our Open Letter was presented to the Congress in the Philippines, which helped to secure a moratorium on GMO imports in that country.

Many thanks to Sandro Puetz of the Gene-ethics network in Berlin for translating our Open Letter into German, and posting it on their website <http://www.gen-ethisches-netzwerk.de>

So, please, scientists please stand up for your convictions and join us. Sign on at our website. We are taking our letter next to Washington D.C. in the US for a special forum on June 29, "Can biotechnology help fight world hunger?" organized by Congressman Tony Hall.

MWH

Scientists, Don't Forget the Social Context!

Prominent UK Member of Parliament lashes out at scientists

Dr. Ian Gibson, MP for Norwich North, chairs the Parliamentary and Scientific Committee and is also a Member of the House of Commons Select Committee on Science and Technology. He was criticised by the scientific establishment as "anti-science" when he raised the issue of genetic discrimination in connection with the increasing number of diagnostic tests made available by the human genome project. His reply is the strongest statement yet that scientists have to be socially accountable for what they do. This is a breath of fresh air. Finally, someone of influence has spoken out for the public as well as the vast majority of scientists who are not genetic engineers. Doctors, lawyers, teachers, even corporations, have been called to account, so why not scientists?

"Why should the issue of genetically modified organisms be raised in its social context by the green movement, for example, and not first in a strong manner by scientists?" he writes in the April issue of the publication of the British Association for the Advancement of Science, *Science & Public Policy*.

He challenges scientists to answer "why they are allowed to spend their time doing 'blue skies' research and are paid for indulging their talents without having to answer for the social consequences of their research." He also called for a full dialogue involving legislators, lawyers, scientists and the public. "Without a proper discourse", he writes, "science will move backwards and fail to capture public support and scientists will continue to be portrayed as dysfunctional and arrogant."

Dr. Ian Gibson cannot be accused of not understanding science, as he has a Ph. D. in Biochemistry and has been a full-time academic until he got elected to Parliament in 1997.

MWH

Announcing Sustainable Science Audit

Joint ISIS and TWN Project

ISIS believes that science as much as scientists should be socially and ecologically accountable, and has launched a sustainable science audit project jointly with the Third World Network (Penang). The first audit is on the 'golden rice' – a GM rice engineered to produce pro-Vitamin A – which is being offered to the Third World as cure for widespread vitamin A deficiency.

The audit uncovers fundamental deficiencies in all aspects, from the scientific/social rationale to the science and technology involved. It is being promoted in order to salvage a morally as well as financially bankrupt agricultural biotech industry.

The scientific / social rationalization for the project exposes a reductionist self-serving scientific paradigm that fails to see the world beyond its own narrow confines. The 'golden rice' is a useless application. Some 70 patents have already been filed on the GM genes and constructs used in

making the 'golden rice'. It is a drain on public resources and a major obstruction to the implementation of sustainable agriculture that can provide the real solutions to world hunger and malnutrition.

'Golden rice' is not a 'second generation' GM crop as has been claimed. It involves standard first generation technology, and carries some of the worst features in terms of hazards to health and biodiversity. Rockefeller Foundation, the major funder of the project by far is reported to have withdrawn support from it, although this is still to be confirmed. Our own recommendation is that the project should be abandoned altogether.

The Report, "The 'Golden Rice' – An Exercise in How Not to Do Science" is available on ISIS' website. MWH

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ISIS Gagged in State of the World Forum

*Prominent progressive figures and world leaders in science and the global society have been invited to this year's State of the World Forum held in New York (4-10 September) raising great hopes that genuine dialogue may begin to heal the divisions in society that led to the collapse of the World Trade Organization Conference in Seattle. But **Mae-Wan Ho** experienced the dark underbelly of repression and the insidious extent to which corporate science has infiltrated civil society.*

I was invited to attend this year's State of the World Forum (SWF) by some of the co-organizers of the event at least six months ago. Some time later and quite independently, John Templeton Foundation and International Space Sciences Organization (ISSO) also invited me to the concurrent, overlapping event on science and spirituality, Future Visions, which they are sponsoring. I was delighted to be invited along with eminent scientists that I would love to meet in person, primatologist Jane Goodall and Amory and Hunter Lovins of renewable energy fame, not to mention prominent figures who have been vigorously opposing globalization, among them my good friends, Martin Khor, Vandana Shiva, Hazel Henderson, David Korten, Nicanor Perlas. I was also full of hopes that I could once again draw attention to the World Scientists' Open Letter by submitting it to the SWF, and speaking about the convergence between the scientific, spiritual and poetic visions, which could serve as the basis for a new global ethic (see The Organic Revolution in Science and Implications for Science and Spirituality www.i-sis.org)

Right from the start, however, I sensed that something was not quite right. My e-mail messages to the organizers were not acknowledged. They claimed never to have received them. My 'visions' and biography were therefore not circulated in advance even though they had been submitted in time. When I finally received the programme, I discovered that my name was not included in any panel, least of all those that had to do with genetic engineering. I decided to attend the conference, if only to deliver the World Scientists' Open Letter as I had promised. The letter was e-mailed to the organizers, with a request that it be posted on the SWF website.

Our letter was not posted, and I was told it could not be. When I asked for it to be circulated at the Future Visions conference, several representatives of Templeton and the ISSO took away the paper and did nothing. When I pressed the matter, they told me the letter had to be 'reviewed'. I also tried to present it again to the SWF. At first, no one claimed to represent the SWF. But finally, through my influential friend, I managed to deliver a copy directly into the hands of Jim Garrison, President of SWF. And that was the last I heard from him. He was careful never to make eye-contact with me again, as were representatives of Templeton and ISSO. I got the message that the matter was not to be raised ever again, or else I would be ex-communicated, ostracized, obliterated.

I did manage to pass a few copies out to key people, but alas, I lost the final copy to a woman who promised to make copies and bring them back the next day. And that was the last time I saw it. She left them 'at home', and claimed she thought I did not need it anymore.

I also managed to intervene from the floor to present a flavour of my 'visions' and got an applause from the audience. But that cost me dear. Next time I tried to intervene, I was told to restrict myself to short questions. At a plenary on science and ethics, I raised the issue of the corporatization of science which is standing in the way of ethical practice of science (see previous item). This was met with stony silence, as were my subsequent interventions on science and spirituality. As for the conference on science and spirituality itself, there were some excellent talks, from unexpected quarters, but few and far between. Overall, there was a distinct lack of either science or spirituality.

But the genetic engineering sessions were worse. It transpired that a Link Foundation, run by a man named Walter Link, was sponsoring all the sessions. The two other scientists invited

were Dr. Martha Herbert, pediatrician from Massachusetts General Hospital, and Dr. Doreen Stabinsky, molecular geneticist and scientific adviser to Greenpeace USA. Both of them, signatories to our World Scientists Open Letter, had been invited at the last minute, which caused me to wonder why. I still thought I was paranoid until the Chairman of the State of the World Forum told me he had tried to get me on as a speaker in the main Forum events, and that too, failed.

Still, someone must have complained, and that got me onto the first, small panel discussion. We were strongly discouraged to go into detail, on grounds that plenty of time ought to be given to the floor. All the same, we managed to broach many fundamental issues: genetic discrimination, eugenics, public participation, accountability in the face of commercialization of science. William Tiga Tita from Cameroon, representative of a network of chambers of commerce and industry, eloquently reminded the proponents of genetic engineering biotechnology not to forget the point of view of the 'Cameroon village boy' in their eurocentric enthusiasm for genetic engineering. He confessed to be 'terrified' as a black man of the resurgence of eugenics, and stressed the need for some form of world governance (see Genetic Civil Rights Alert, this issue).

As to playing God, a theologian declared that was exactly what we should do, as we are all made in the image of God! That terrified me most of all. There is a distinct tendency for commentators, many of them theologians and bio-ethicists and others who don't know much science, to fail to distinguish hype from reality. This leads to fantastic future projections on the one hand and on the other, resignation that there is nothing we can do to stop whatever scientific progress may bring. (Speaking of fantastic projections, Paul Davies, famous physicist and author, stated in his opening plenary lecture that the human genome map is showing how everything is genetically determined, even evil; and he questioned whether it was moral to remove evil which is intrinsic to human nature by genetic engineering!)

And that was the last and only time I was allowed on any panel. I got an inkling of the hidden agenda at another session I attended. This time, Walter Link himself was in the Chair. Panelists were given about two minutes each to say what their position is on the human genome project and all its fall-outs (see Human Genome: The Biggest Sellout in Human History), while the Chair and moderator (also from Link Foundation) were allowed longwinded, pious-sounding and essentially empty speeches. The audience were therefore invited to comment in the absence of any real information or knowledge. Martha Herbert and Doreen Stabinsky defended accountable science brilliantly and gallantly throughout.

I finally lost patience when Walter Link said it was ethical to reduce suffering with genetic engineering, and Martha Herbert and Amory Lovins both pointed out that there were other means, and that it was a pity Biology has been completely taken over by molecular genetics. I intervened and said I can confirm that the Universities have been completely taken over by corporations and that molecular genetics is excluding almost all other approaches. Also, we are attracting the wrong kind of people into science who are more interested in making money than in science, let alone alleviating suffering. And those who want to work for public good are being victimized and villified. We should be banning and revoking all biotech patents in the interest of alleviating suffering. The bottom line of ethics is to ask if something will be done when there is no hope of making lots of profit.

Walter objected that I was straying too far from ethics, that the issue of patents had been thoroughly discussed at another panel the day before, and he asked people not to go into that again. In his long summing up, Walter announced that he was very satisfied with the discussions, and it was the first time that people with such a wide range of disparate opinions are brought together so that they can listen to one another. He even chided the audience for applauding the scientists who urged caution and respect for the web of life, but not those 'bioethicists' who proposed going ahead with genetic engineering.

Walter Link reminded me of some of the people who earn a fat fee 'facilitating' conflict resolution. As soon as anyone raises any point of substance, they would steer the discussion away to calmer waters in order to engineer a 'consensus'. Walter is looking for funding to bring panels, such as the ones he has assembled, around the world so that "all voices will be heard". (Actually, it is easy to guess whom he is going to exclude.) His next stop is India. So watch out. I can imagine a string of conferences stretching out to infinity, accompanied by the ceaseless droning of soothing voices to calm all dissidents, to lull people into thinking that their concerns are being addressed, reducing them to a state of confused impotence, talking them into mental and physical exhaustion if not paralysis while industry trundle on full speed.

Angry Thai Farmers Say Ban GM Rice

They demand protection of indigenous knowledge and wisdom Mae-Wan Ho reports on an extraordinarily invigorating and informative gathering of farmers, activists, government officials, academics and rice research scientists (with many thanks to tireless interpreter, Chalotorn Kansuntisukmongkol, back home on holiday from University of California, Davies).

Farmers from all over Thailand flocked to the day-long Rice Forum held in the Museum Hall for Culture and Agriculture in Kasetsart University near the outskirts of Bangkok on August 15. There, they met with activists, government officials, academic scientists, students and indigenous peoples to hear speakers which included distinguished Professors from the Universities and Ministry of Agriculture in Thailand, the leader of the Karen tribes as well as invited foreign guests. This was in preparation for the long march in September, in protest of the introduction of GMOs to Thailand. Monsanto from next door sent their representative to listen in.

Professor Rapee Sakrik, twice Rector of the University and orchid breeder, opened the morning session with an elegant reminder of the importance of orchids to Thai culture in developing an inner appreciation of the fine things of life. It is the good intention from the heart that would really change people's perception and action, he said.

Dr. Ampon Kittiampon, Deputy Secretary of the Ministry of Agriculture and Cooperation, regrets that modern knowledge does not include traditional wisdom, and that the emphasis on cost-effectiveness has sidelined societal values. The recent economic crisis gave the opportunity to reassess the balance between cultural conservation and external demands. "Rice is what supports our society" he said, "Export is important but cannot be the only focus." External influence and the Intellectual Property Rights both undermine traditional knowledge. Furthermore, if farmers have to buy seeds, it would compromise food security.

Joni, leader of the Karen, told his audience that "rice is life for the Karen" and that losing the seed is to lose life itself. Their whole culture revolves around rice. The spirit of rice rises to heaven every year and a rice ceremony takes place before planting. The Karen used to plant 100 varieties of which only 5 are now left. He blamed the academics and the authorities for not understanding swidden (shifting) agriculture which works on a four year cycle. Planting rice in the same place for 4 years led to the loss of both the rice crops and the forest.

Prof. Prapas, rice breeder from the Ministry of Agriculture and Day-ene Siripetra from the Khoaw Kwan (or Rice Spirit) Foundation gave differing versions of the history of rice breeding in Thailand. In the olden days, Prof. Prapas told us, there were four ministries, one of which was the Ministry for rice affairs. The Department of Rice, which became the Rice Research Institute, used to research social and cultural aspects of rice and not just genetic modification. During the reign of King Rama V, Thailand was exporting rice, but the price was very low. So the King organized a competition on rice varieties. This led to many varieties being developed, and for years, the top ten in the Canadian rice competition went to Thailand. Now, only jasmine rice is left. In those days (45-50 years ago) the main focus of farmers was to plant for their own use. Now the focus is on export and high yield. Prof. Prapas suggested that genetic engineering may be used on traditional varieties to create high yield and good taste, or to resist pests.

Day-ene Siripetra told his audience that the practice of rice planting did not change until the British forced Thailand to open her market. After that, Thailand developed irrigation systems, rice research stations and organized rice competition. The Rice Research Institute was established to get varieties that were good for export (those that won prices in Canada). Of the ten that won prices, nine were no longer used, but kept in the seed bank. After World War II, Thailand had a contract with the US. Dr. Love, a rice specialist from the US, came to Thailand to train Government officials to collect rice varieties. A total of 120 000 varieties were collected, which Dr. Love took to the US. (So, biopiracy is nothing new!) The present day Jasmine rice was also developed by the farmers themselves.

In the 1960s, the Green Revolution was introduced to Thailand by the World Bank and the Rockefeller Foundation, and caused drastic loss of traditional varieties through emphasis on high yield with high input. Farmers were told to exchange their traditional varieties for the new ones which turned out to be very susceptible to disease. Norman Borlaug, father of the Green Revolution, came to Thailand two weeks earlier to promote GMOs. From past experience, Day-ene is not at all convinced GMOs are the way ahead.

Farmer after farmer made passionate and at times angry contributions from the floor. "Jasmine rice is losing fragrance because the Ministry of Agriculture is promoting new varieties. The new varieties cross with the old and make them lose fragrance. Farmers are in debt because merchants reduce the price for the loss of fragrance."

“We must revive traditional varieties and the Government must raise the price of traditional varieties.”

“Lots of fragrant rice used to be planted but the Government developed varieties for export and emphasized yield, so farmers stopped planting fragrant rice varieties.”

“To conserve rice varieties, the Government must buy different varieties.”

Farmers confirmed that the use of pesticides and fertilizers resulted in many diseases, while traditional varieties never gave so many problems. They also pointed out that the benefit of rice planting is that it provided food and feed for animals as well as a surplus for selling on the market. “Without rice planting, we become poorer.” They called for more integrated farming. In concluding the session, Joni deplored the fact that people are losing their natural cooperative tendencies on account of the money culture. Siripatra called for a change of paradigm, and not just try to patch the old one up. The really holistic way is to integrate agriculture with culture: rice as life and not rice as commodity.

The first session in the afternoon dealt with the technical aspects of GM rice, which confirmed what had been said in the morning already. I gave an overview of the state of resistance to GM crops all over the world, explained what genetic engineering is and how it is really a whole way of life that threatens not just food security but our most deeply held social values. The resistance to GM is a struggle to reclaim the good life for all in every sense.

Devlin Kujek from the Barcelona based ngo, GRAIN (www.grain.org) gave a very useful review of the transgenic rice engineered to resist bacterial blast, BB rice for short; which the International Rice Research Institute (IRRI) is to field trial in South East Asia, starting in the Philippines. The Philippine’s Biosafety Guidelines actually state that,

“Genetic manipulation of organisms should be allowed only if the ultimate objective is for the welfare of humanity and the natural environment and only if it has been clearly stated that there is no existing or foreseeable alternative approaches to serving the welfare of humanity and the environment.” It turns out that only green revolution varieties are susceptible to bacterial blight and not the local varieties. IRRI has in fact caused bacterial blight and is proposing to use the GM rice to solve the problem. But past experience has shown that this strategy will not work, as the bacterial blight will merely mutate to a new form.

Lene Santos, also from GRAIN, exploded the myth of the ‘golden rice’ - engineered to produce pro-vitamin A in the polished grain – that is supposed to cure widespread vitamin A deficiency in the Third World. She pointed out that the poor and malnourished are actually deficient in multiple vitamins and nutrients, and that the problem cannot be addressed by pro-vitamin A alone. There are already some 70 patents on the golden rice, owned by 32 companies. The rice variety modified is a temperate rice unsuitable for growing in the tropics. (See also ISIS Sustainable Audit #1, The Golden Rice, an Exercise in How Not To Do Science www.i-sis.org).

The Monsanto representative finally spoke up and said that the company is only trying to improve the quality of life for people in the Third World, and villagers can choose not to use GM crops. China and Singapore, she said, are promoting and embracing the technology enthusiastically just so they won’t be dominated by foreign countries.

According to Devlin, a Chinese contact told him that they had the same problems with Monsanto’s GM cotton that was known in the US, with cotton balls dropping off when the crop was sprayed with Roundup. But the farmers were under contract to Monsanto to say nothing!

Monsanto was rebutted by a Professor from Prince Songkla University who dwelt on the importance of protecting Thailand as a centre of biodiversity of rice, and that it would be very dangerous to release rice GMOs. (Thailand already has a huge variety of rice, all differing in both fragrance and colour - shades of yellows, reds and black - rich in all kinds of vitamins and minerals.) Another forceful speaker from the floor said, “Monsanto, don’t try to push us! Academics and Government officials ought to try to find a clear understanding of how to protect the natural world. Instead Thailand is being dominated by a group of corporate scientists reaping benefits from the developing to the developed world. Small farmers are being forced into contractual arrangements, or bribery, and have no choice. The Philippines are taking an aggressive stand before the GM crops come in.”

The last session was on intellectual property rights and the speakers were Professor Chakkrit, an academic from the Department of Law, and Mr. Bantoong of the Biodiversity Institute. Thailand already has comprehensive draft legislations to protect her genetic resources, the forests and especially her rich tradition of herbal medicines, which is being recovered for use in public health, in an effort to substitute for the high costs of imported medicine and to promote the exchange of knowledge and resources in the form of medical herbs, health foods and other healthcare items. Western scientific knowledge is combined with indigenous scientific knowledge,

and government agencies, ngos and academics are all involved in the important task of recovering traditional medicines. Provisions are being made to register inventions under the ownership of communities, ngos, traditional healers, monks and private individuals. This model should be taken seriously by countries all over the world, as it will do much to counteract corporate biopiracy as well as unsustainable corporate monopoly on food and health.

A spokesperson from the Agricultural Research Department said, "Our biodiversity is our national treasure. The problem is how to protect our treasure which include tropical fruits and microorganisms." He stressed the need to conserve living organisms in nature and not only in gene banks. In the Rice Research Institute in Central Thailand, 30 000 varieties of rice have already been collected, and it is not at all clear that they can keep. "About GMOs, we don't allow the use of GMO commercially, only for research."

This brought a torrent of condemnation from the farmers.

"The Government has led us in the wrong direction. Up to now we did not know anything about GMOs, but thanks to this seminar, things have changed. Research Institutes have concentrated in creating varieties that are sensitive to fertilizers and dependent on pesticides, and now GMOs are much worse. We are losing our life!"

"The lies we have been told! The patents that have been obtained based on modifying our varieties. And adding vitamin A to our varieties for higher profit."

"Anyone pushing GMOs is wicked. We have to stop them. We cannot allow GMOs in Thailand."

"We have to collect names of villagers in Thailand who do not want GMOs and tell the Department of Agriculture and Development to stop."

"Stop explaining the benefits of GMOs!"

"Patenting of rice is robbing us of our livelihood."

"We still have lots of varieties But we may lose them because of Government policies. The Government does not care about the traditional way of life in the highlands. Government says people don't have knowledge and destroy natural resources under swidden agriculture, and arrest them. It is the Government that is destroying our rice varieties, first through the green revolution, and now trying to fix-it with GMOs"

In a television debate two days later, Dr. Suthep Limtongkul, Director of Rice Research Institute, announced that they have put all GM rice in the gene bank, and will not carry out any more research on them. But still, farmers want the GM rice destroyed.

World Scientists in US Congress

Mae-Wan Ho reports on a special Educational Forum on Biotechnology that packed the Golden Room on Capitol Hill

There was standing room only when Rev. David Beckmann began his introduction as Moderator of the event, and people were still filing in. The educational forum "Can biotechnology help fight world hunger?" (June 29, 2000) attracted a record number of congressional staff as well as members of the public. Our World Scientists Open Letter, updated, and signed by 327 scientists from 38 countries, was presented to US Congress on the occasion and was crucial in drawing attention to the scientific debate.

The event was sponsored and organized by Congressman Tony Hall, well-known for his efforts in raising the profile of world hunger. In his opening remarks, he stressed that he was not interested to know if biotechnology could make money, but in how it could do something for hungry kids and how we can share prosperity with the poor.

Senator Richard Lugar, Chair of the Senate Agricultural Committee, a strong supporter of biotech industry, condemned the opposition as 'emotional' and stressed the 'enormous potential' of GM crops, citing 'golden rice' - engineered to produce pro-vit. A - as a cure for vit. A deficiency in the Third World. In anticipation of just this bit of biotech propaganda, ISIS' Sustainable Science Audit #1, "The 'Golden Rice' – An Exercise in How Not to Do Science" had been circulated in advance, thanks to Consumer Choice Council.

Representative Robert Ehrlich, who claimed to represent small businesses, answered yes to the question. "Sound science" ought to be used, he admonished. He had seen what happened in Europe when ideas get demonized quickly, and it should not happen in the US.

Representative Dennis Kucinich, who has introduced a bill for labelling of GMOs to Congress, reminded everyone that we all have a common interest to feed the hungry. But his answer to the question was no. The world is not short of food, he stated, and if people are hungry, then we have to think again. It is financial hardship and poor distribution of food that are the causes of world hunger. Perhaps sustainable agriculture can help, but the Green Revolution did not.

Biotechnology should encourage sustainable agriculture that can be compatible with mandatory labelling, which is the right to know.

"No one should have to choose between food inadequately tested and no food at all!" Kucinich stated, "Food standards should be the same all over." He was against food aid dumping. It was an ethical responsibility not to do so. This remark was particularly pertinent, as Dr. Vandana Shiva had just presented Congress with a memo objecting to GM food being dumped as relief to flood victims in Orissa and elsewhere.

Four scientists were the main presenters, with Dr. Martina McGloughlin of UC Davies and Dr. C.S. Prakash of Tuskegee University arguing that biotechnology is needed to combat world hunger and Dr. Vandana Shiva, Director of the Foundation for Science, Technology and Natural Resources in India and myself from ISIS arguing that it is far from needed. On the contrary, sustainable agricultural methods are already proving successful all over the world, that biotechnology and corporate monopoly on food through seed patenting and biopiracy can only exacerbate world hunger, while the question of safety is at best unresolved.

After the presentations, a questions and answers session was led by prominent 'challengers' representing the ngos, the industry and the press. It was notable that although McGloughlin and Prakash were both scientists, neither spoke about science at all. They refused to acknowledge that there is already evidence of actual and potential hazards, while offering no scientific evidence to back up their claims that GM crops are safe. McGloughlin even went as far as to accuse the European Union of erecting false trade barriers on grounds of safety. When Vandana Shiva brought up the subject of the patents on the Indian Neem tree, Basmati rice and other indigenous plants that Indian farmers have developed and used for centuries, Prakash loudly proclaimed, "I am sick and tired of hearing about biopiracy. Thank God for biopiracy..."

I stressed that there was genuine scientific dissent within the scientific community, as witnessed by the hundreds of scientists who have signed our open letter and the FDA's own scientific advisors who warned of new risks associated with GMOs. When I reminded the house that the lack of scientific consensus and uncertainty are the conditions for applying the precautionary principle, supporters of the biotech industry predictably scoffed. (For more detailed arguments for the precautionary principle as part and parcel of sound science see Use and Abuse of the Precautionary Principle, this issue).

The representative from Zeneca, also predictably, sang the praises of golden rice, which they have recently acquired the rights for, and have announced that they will offer it 'free' to the Third World. I challenged her on how something that already has 70 patents can be offered free, and hoped that Zeneca will reply in detail to ISIS' Audit. She replied, admitting that the patents issue is very complicated and has to be solved.

Michael Pollan, the N.Y. Times journalist who stunned the United States into action on GMOs with his famous article on Monsanto's GM potato, confessed to be not at all convinced by the arguments on benefits. "Have the benefits been proven?" He asked, "Have the risk been proven to outweigh the benefits?" He urged precautionary approach. "Industry is in trouble", he stated, "But why should I eat a GM potato?"

In his summing up, Rev. David Beckman, President of Bread of the World, stressed that other tools besides biotechnology must be used to combat world hunger, that it is the imbalance of power that is the cause of world hunger. He also touched on the ethics of science and the fact that people don't quite trust scientists anymore.

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ISIS Exposed Illegality of GM Seeds

ISIS presented expert evidence at a public hearing, showing that the UK Government was acting illegally in proposing to place a GM maize on the National Listing.

When the UK government proposed to put Aventis' GM maize Chardon LL on the National Listing for commercialisation early last year, they received hundreds of protests demanding a public hearing, which was eventually held in September through October. In her witness brief presented at the hearing October 26, Mae-Wan Ho pointed out that Chardon LL could not have passed the EC test for Distinctness, Uniformity and Stability (DUS), which was required for commercial approval. *Crucial molecular genetic data were missing, not only from Chardon LL, but from all GM crops approved thus far.*

Her contention was confirmed in a press release sent out by The Ministry of Agriculture, Fisheries and Food www.maff.gov.uk on 31 October, where it says, "UK Ministers are urgently assessing new information relating to the proposed National Listing of Chardon LL..."

“The Government has learned from the French Authorities that the data from French trials on varietal distinctness, uniformity and stability (DUS), which supported the Chardon application for National Listing in the UK, were based on 1 year’s data from accredited breeders’ trials and 1 year’s data from Government run trials. This is apparently one of the procedures allowed by the French authorities for DUS trials of new maize varieties. The relevant Directive (72/180/EEC) requires two years of official trials.”

Mae-Wan Ho has argued that complete molecular genetic data to document structural as well as functional stability of the GM variety in at least 5 successive seasons of growth must be produced for commercial approval. Two years is not enough. The [full transcript](#) of her presentation can be found on ISIS website. Other expert witnesses who have appeared include Dr. Vyvyan Howard, Dr. Arpad Pusztai, Ms Angela Ryan and Prof. Brian Goodwin. All transcripts can be found on MAFF’s website www.maff.gov.uk

The public hearing has been suspended indefinitely since MAFF’s press release.

TRIPS Abandons the Dying

*TRIPS ensures a one way flow of revenue, from poor to rich. The Pharmaceutical industry played a major role in drafting it, and is now fiercely defending it. **Angela Ryan and Nick Papadimitriou Report.***

Newly elected US President Bush, a republican, has strong connections with the pharmaceutical industry. The industry spent nearly 70% of their \$24.4 million campaign budget on his presidential election. The lobby wielding the most power is the Pharmaceutical Research and Manufacturers Association (PhRMA). Their combined worth is twice the total GDP of all Sub Saharan Africa and they are now bringing their wealth to bear directly on the struggle between western patent rights and the rest of the world’s need for affordable medicines [1].

Clinton, Al Gore’s democrat predecessor, resisted the industry lobby and was advocating release of generic AIDS drugs to people in the third world. Bush intends to reverse this initiative [2].

A leading Indian drug company, Cipla, has taken on British giant GlaxoSmithKline by refusing to honour their patents, making cut-price versions of anti-AIDs drugs. Cipla is offering the three-drug anti-AIDs cocktail of stavudrine, lamivudine and nevirapine for just \$600 or £430 per patient per annum. And they are selling it for an even cheaper price of \$350 to *Medecins Sans Frontieres*, the volunteer doctors who have set up AIDS clinics in Africa, where the AIDS crisis is mounting. GlaxoSmithKline is threatening legal action [3]. Two of the key drugs in the triple therapy for AIDS were invented by the US National Institutes for Health, paid for out of the public purse.

Across Africa and the developing world, millions of people are dying of diseases that are treatable in the west, such as diarrhoea, meningitis, malaria, TB as well as AIDS. Under the Trade Related Intellectual Property Rights or TRIPS agreement of the World Trade Organisation (WTO), signatory states can pass clauses, as South Africa and Brazil have done, to by pass patents and make or buy cheaper drugs in cases of dire emergency. The poorest countries have until 2006 to comply with TRIPS by passing their own patent laws.

This month, 42 pharmaceutical companies including GlaxoSmithKline have brought a lawsuit, case No 4183/98, in the South African high court against the South African Government in an attempt to block the import of cheap medicines. The case has taken three years to prepare and employ virtually every patent lawyer in South Africa. On 5th March they will try to stop the South African government from buying generic medicines from countries like India, Brazil and Thailand, where drug patents are ignored on grounds of dire need.

The pharmaceutical companies claim that section 15c of the South African Medicines Act 1997 was not properly drafted in line with TRIPs. They say it gives the South African government too broad a power to buy in cheap drugs from abroad, when the situation is ‘not strictly an emergency’. Few can argue AIDS is less than that in South Africa where 2.5 million people die every year from aids related illnesses.

Last month, Bush’s new administration mounted the first challenge in WTO, claiming Brazil is in breach of TRIPS. The offensive against Brazil and South Africa marks a determination by drugs companies to uphold patent rights and maximize profits. The Pharmaceutical industry is the most profitable industry in the US, its profits soared by 36% recently. Additionally, only 10% of research and development go on drugs that account for 90% of global diseases, the bulk being spent on first world afflictions such as obesity and chemical dependency.

The WTO is a law unto itself, where multinationals are writing the rules. The US gold rush to patent drugs and life is a strategy to scare off competition and stake out the market. It leaves

developing countries further disadvantaged. During 1997, only 31 out of 26,000 patent application filed in Africa came from resident Africans [4].

1. "Industry that Stalks the US corridors of power", by Julian Borger, *The Guardian*, Tuesday 13th Feb. 2001.
2. "A lot of very greedy people", by John le Carr, *The Guardian*, 12th Feb 2001.
3. "Crusading Indian firm takes on might of GlaxoSmithkline", by Luke Harding in New Delhi and Sarah Bosely, *The Guardian* Wed 14th 2001.
4. "The profits that Kill", by Madeleine Bunting, *The Guardian*, Monday Feb 12th 2001.

Human Studies on GM Food Risks

The UK Medical Research Council has established an Expert Group to consider GM food risks and feasibility of human studies to assess the risks. Their Report, published June 2000, acknowledged GM food risks, but dismisses existing evidence from toxicological and epidemiological studies, and does not call for more research before GM foods are grown for human consumption. Instead, it proposes long term studies on humans, and that "randomised controlled trials" could be conducted on infants and people receiving "a free supply (to promote compliance) of a key staple food". Mae-Wan Ho and Angela Ryan report.

The Expert Group considered many of the health impacts highlighted by critics, such as altered nutritional quality of foods (and attendant impact on various chronic non-communicable disease processes), acute and chronic toxic effects, immune effects, transfer of antibiotic resistance genes to human pathogens and risk of infectious diseases (from viruses used as gene vectors).

It also advocates removal of antibiotic resistance genes from GM constructs used in the production of food, but falls short of calling for their removal in animal feed; despite growing evidence that bacteria can pass from farm animals to human beings – *E. coli* 0157 is a well known example.

One notable omission is genetic damage due to random insertion of the constructs into animal and human cells, which has the potential to trigger cancer.

The Report is critical of the principle of substantial equivalence in risk assessment, and acknowledges that the principle does not address unintended effects. It recommends using both state-of-the-art and routine methods to screen for unintended changes in gene expression and metabolites.

However, the more contentious half of the report proposes human studies to assess the risks. Is it ethical to do so when there is already abundant evidence suggesting that GM foods may be unsafe? (see "The Precautionary Principle and Scientific Evidence", this issue). This is a blatant example of the anti-precautionary principle being applied in risk assessment. Regulators and pro-GM scientists alike are still saying, "there is no evidence that GM foods are harmful", and hence we must accept GM foods. Whereas what they should be saying, at the very least, is, "there is no evidence that GM foods are safe and hence we must not approve them for release".

The report criticises established toxicological studies using cells, cell cultures and animals, on the spurious grounds that "whole foods represent a bulky and complex chemical mixture, only limited quantities of which can be fed to animals". And this was considered one of the major shortcomings of Pusztai experiment. In effect, it is dismissing existing evidence from animal studies already indicating the GM foods may be unsafe.

Similarly, it finds fault with epidemiological studies because of the lack of "firm hypotheses as to what the adverse effects of GM foods are" and "the difficulty in assessing the extent of GM food exposure". In this way, it also disposes of circumstantial evidence that soya allergies had gone up 50% in the UK within a year, coinciding with the increased import of GM soya (see "GM soya and increased soya-associated allergy" ISIS News #3, December 2000 <www.i-sis.org>).

It transpires that "prospective studies" have already begun several years ago with "detailed personal and dietary information" that can be obtained from major supermarkets, and blood samples have been taken and put into storage. Other prospective studies have also collected blood and other biological samples from individuals and "these would allow markers of GM food consumption in blood to be assessed as a measure of exposure, should such markers be developed."

The most controversial proposal is for "randomised controlled trials". "Theoretically, the most effective studies are likely to be those where the GM food selected forms a major and consistent part of the diet. Randomisation of infants, whose whole or predominant source of nutrition happens to be infant formula, to formulas based on GM versus non-GM soya should be a good example. Another would be the random assignment of individuals or families to a

free supply (to promote compliance) of a key staple food (that exists in GM or non-GM form) e.g. potatoes, bread or rice.”

The most immediate group of people who would qualify for such trials is the starving, who could be asked to volunteer as guinea pigs in order to obtain food. In effect, this may already be happening, as GM foods are being dumped as ‘food aid’ on the Third World and Latin American countries.

Continuing Blair Whitewash over Farmscale Field Trials

The new Agricultural and Environment Biotechnology Commission in the UK has no intention of questioning the field trials or addressing any awkward questions over safety. It appears their job is to pacify public outrage, sweet talk organic farmers and effectively pour white wash over the whole affair. Angela Ryan reports on the Commission’s first meeting with the public on December 7, 2000.

The room was packed with people all anticipating decisive action from the new Agriculture and Environment Biotechnology Commission, especially over the UK farm scale trials of genetically modified organisms. But they were disappointed, as it became clear that the new commission has no intention of questioning the field trials, nor the rigor of the scientific framework upon which they are based. Instead its policy is ‘business as usual’.

The vast majority of people in Britain today do not want the trials to go ahead. Many important organisations, such as the Soil Association have openly condemned them, fearful of GM contamination that even the Department of Environment Transport and the Regions (DETR) acknowledges as ‘unavoidable’. Farmers are unwilling to participate and those who have been persuaded through financial payment now stand to lose value on their land. Supermarkets across Europe have withdrawn GM foods and the public are angry at being used as guinea pigs in a feeding experiment with no controls. The resistance to GM crops is widespread and runs deep, to the extent that many ordinarily law-abiding citizens have taken direct action and have defiantly dug up GM crops, a trend that is set to escalate this year.

The Commission is choosing to ignore all of this. Instead of facing the controversies head on, it intends only to analyze the trials, and to recommend to ministers improvements in strategic decision-making for the future. It will certainly not resolve any of the burning questions over safety.

Organic farmer Helen Browning pressed the Commission to “tackle the hot potato of segregation distances” and the problems associated with contamination of organic farms. But Dr Phil Dale of the John Innes Center, a well-known GM supporter, stated that the commission could only “gather evidence” on segregation distances and advise. The chairman, Professor Malcolm Grant, was very diplomatic and questioned whether the commission needed to “re-prioritize its work plan to tackle gene flow and cross contamination first”. Dr. Matthew Freeman put forward the idea of a “crisis management strategy”, after which Helen Browning pointed back to the facts: gene flow is an annual crisis, threatening the livelihood of organic farmers.

The members of the Commission skirted around the issue of contamination for some time, uttering words like “gene flow is a huge issue and not a simple one”. They contemplated the notion of adding more topics to the work plan but eventually arrived back at the same position; “we’re not really structured to react to things, we must take a more long-term view”.

Helen Browning, by now exasperated, questioned whether they were all suffering from “too much too soon” and all that could be realistically done was to act as mediators, un-blocking channels of communication before the next growing season?

Although the government has set up this Commission to deal primarily with the farm scale trials, they are not allowed to interfere with the workings of the trials. Instead, it appears their job is to pacify public outrage, sweet talk organic farmers and effectively pour white wash over the whole affair. It later transpires that the commission has just spent £90,000 of taxpayers money with a PR agency, presumably to help it achieve those aims.

As the day wore on, the implications began to sink in. If the Commission is not going to tackle segregation distances, then where does that leave all the other important safety questions, like horizontal gene transfer and GM animal feed, for example?

During the deliberations, Deputy Chair Julie Hill proposed a ‘state of the debate’ paper, which was seconded by Dr. Sue Mayer of Genewatch. Barrister Justine Thornton reported that a background paper was being prepared and they are looking at liability and ‘who’s going to pay for the damages?’. She said “There is the possibility of a compensation fund for organic farmers, along with insurance schemes, and they are considering whether GMOs should be regulated separately.”

One of the major safety concerns with GMOs is the fate of transgenic DNA released into the environment. Whilst the words 'horizontal gene transfer' are included in the work plan, they are followed by a definition which states, "by which we mean where a GM construct could be transferred to a wild relative of the licensed crop (or animal e.g. salmon)."

Not only is this inaccurate scientifically [1] but it suggests the Commission is adopting the same approach as the biotech industry and avoiding the issue of horizontal gene transfer altogether.

Strong objections were raised during the open session, which prompted a re-write. Justine Thornton announced they would delete the words 'horizontal gene transfer' and replace them with the words 'gene flow', which is a more generic term, covering both vertical and horizontal gene transfer. Additionally, they will specify "within species, between species and between distantly related species". However, this does not resolve the matter. 'Gene flow' is usually interpreted to mean 'cross-pollination' only, and is regularly used in this context by the biotech industry in applications for licence. The Commission should continue to use the words 'horizontal gene transfer' and simply remove the definition.

The trials are not designed to investigate horizontal gene transfer. The Royal Society, The British Medical Association and even US FDA scientists have all stated that the use of drug and antibiotic resistance genes coupled to the potential for horizontal gene transfer present unacceptable risks to human health. Despite these warnings, GM crops continue to contain such genes and those involved in the trials are no exception. In fact, several of the test crops are even worse, and contain genes and constructs intended to render harvested seeds sterile (see "Terminator Crops are here!", this issue).

To allow a major potential for harm to proceed unchecked is to exercise 'the anti-precautionary principle' [2]. Robin Grove-White explained that although they would have liked to commission a full scientific study on horizontal gene transfer, they were unable to do so as the science behind the trials was framed by industry. In other words, their hands are effectively tied and no investigations will ensue.

Throughout the meeting, Dr Phil Dale continually asserted that they needed to question how to make the regulatory process better in terms of decision making. At one point he became rather frustrated and blurted out "we are not ARCE! We must give a little judgement and provide a scientific context. We don't want to be forced to expand the scope. We can't take on gene flow in parallel with the farm scale trials". He virtually ordered everyone to allow another year of farm trials to proceed unhindered, and to avoid all the awkward unanswered scientific questions over safety.

Dale also managed to deflect the most important point made throughout the whole day, which came from an ex-Monsanto employee. She told the meeting that "the future of biotechnology is genomics [rather than GM]. The scientists at Monsanto are all jumping up and down about genomics". She strongly advised the commission to go to industry scientists when seeking the best advice.

When the subject of genomics was broached again during the main meeting, Dr Phil Dale intervened quickly and stated "I don't see GM crops as different from conventional crops. GM is just an extension of traditional breeding programmes". He then questioned whether genomics and marker assisted breeding was still biotechnology. How was the Commission going to square what is biotechnology and what is not, in this respect? Anne Bradley clarified this point and said that GM technology is biotechnology and marker assisted breeding using genomics is biotechnology too. Dale then re-phrased the question and asked "if this be the case, then does the Commission reject conventional breeding as biotechnology?" The answer to which should have been a resounding "yes".

Unfortunately, at this point, the chair decided to close the discussion saying there was a "general pushing out of the term 'biotechnology'."

The Monsanto scientists are right, GM is an obsolete practice nowadays. It is evident that transgene silencing or instability is an insurmountable problem, as is well documented in the numerous scientific papers published on the subject during 2000, including some out of Dr Dale's own laboratory [3]. Moreover, the health and safety risks associated with GM are great and far out weigh the benefits.

Genomics is much less risky. It is what the human species have been doing for thousands of years, only "with the lights on", to quote a Monsanto scientist (farmers weekly). By using marker-assisted breeding, genes of interest can be tracked as they are passed on in successive generations, speeding up breeding programmes considerably. New varieties can be obtained within 3- 5 years, as opposed to 10-15 years with traditional breeding practices, it is claimed.

This is, or should be, the state of the debate: there are strong indications that GMOs are dead. Genetic instability renders them too risky economically and it is time to back off and move on. Genomics is the only way forward for plant biotechnology. If the commission is to be of any value, then it must come to terms with this and stop the trials, which are a drain on public resources as well as hazardous. Among other things, it must arrange 'clean up' operations to decontaminate affected land.

1. For a recent exposition see "Horizontal gene transfer – hidden hazards of genetic engineering" by Mae-Wan Ho www.i-sis.org
2. See "Use and abuse of the precautionary principle" by Peter Saunders www.i-sis.org
3. Transgenic instability is well-covered in past issues of ISIS News www.i-sis.org

Argentina Cools to GM Crops

Argentina, the second largest GM producer in the world after the United States, is having second thoughts as world market collapses. Mae-Wan Ho reports while on tour in Latin America last September to October.

This was the message conveyed by both the Environment Minister Ruben Dario Patrouilleauz, who headed the Argentinian delegation to the Biosafety Protocol Conference in Montreal, and the Director General of Cultural Affairs, Raul Alfredo Estrado Oyuela. Both spoke at a special Parliamentary debate on agricultural biotechnology in La Plata, Federal Province of Buenos Aires, on 26 September. The very fact that such a debate took place was significant. Argentina had a recent change in Government, which now has a farming crisis on its hands. What better time to rethink agricultural policy?

Patrouilleauz recalled with dismay how he had to side with the 'traditional enemy' the United States, against Colombia in the Biosafety Conference. "Things have to change now", he said. "There are different positions within the Government, which is improving all the time. Argentina cannot afford to turn a blind eye to what is happening in the GM market; it would be disastrous." Patrouilleauz wants biosafety to be moved from the Department of Agriculture to the Department of the Environment, with a clear implication that the Department of Agriculture has not been doing its job properly. The precautionary approach must be adhered to, he insisted, as science is always uncertain.

Oyuela went even further, and stressed it is the precautionary *principle* that must be adopted, and not just the precautionary *approach*. He too, drew attention to the state of the GM market, and urged Parliament not to neglect what the people want.

Patrouilleauz and Oyuela are not alone. An informal group advising the Government, by the name of Gruppo de Reflexion Rural (GRR), have spearheaded the recent GM debate in Argentina and attracted international attention. A key member of the group, Adolpho Boy, is a lively Professor of Agronomy who has been in charge of plant research in Argentina for 36 years. He confessed he was one of the top boys who regularly got invited to the international plant research institutes. Over the years, however, he came to realize that academic scientists like himself had contributed nothing, to say the least, to sustainable agriculture nor to the benefit of small farmers.

GRR is an informal association of like-minded academics, journalists and activists all working towards the fundamental social change that is needed to get out of the vicious cycle of extravagant consumption and destructive extraction of natural resources. At least two of the members of GRR have been political exiles, one of whom still bears the scars of torture. It is a sober reminder that the right to dissent has been hard-won.

Argentina is responsible for perhaps one fifth of all GM crops in the world today. The largest crop by far is soya, of which 84% are GM; compared with 10% in cotton and 6% in maize. During the buffet lunch in Parliament, the Minister of Trade assured me that farmers in Argentina are very pleased with the GM crops and have had no problems selling their produce to Europe as well. Most of the sales had been in the form of processed oil and animal feed. I told him that the major food suppliers and retailers in Europe are going for an 'Identity Preservation System', which tracks the produce from field to plate, in order to ensure that no contamination with GM will occur at any stage. (Whether they can be trusted to actually do so is another matter.)

But things aren't quite as rosy in Argentina as the Minister of Trade has presented. Argentina is a country of big industrial farms. A single farm can be as large as 65 000 hectares. There simply has been no incentive to farm efficiently or sustainably.

On the last day of my sojourn in Buenos Aires, we went to San Andres de Giles in the suburbs. There, I met Juan Carlos, a 'small' farmer with 500 hectares. He has indeed planted GM soya and found it more profitable compared with non GM soya. It was not because GM seeds were less expensive, for they cost more; nor because GM soya yielded more, because it actually yielded

less (confirming University-based studies done in the US). The reason it worked for Juan Carlos was because he had previously used three different expensive herbicides with non GM soya, and is only using one with the GM soya, Roundup, which Monsanto is selling cheap. Another reason is that farmers in Argentina have been allowed to save the GM seeds, while farmers elsewhere are prevented from doing so under the threat of draconian legal action from the company.

Juan Carlos was taken aback when I told him that, as a result of world-wide resistance to GMOs and the collapse of the international market, the United States has drastically reduced planting of GM crops in the past year. "Be sure to tell people about that", he said to me quietly before we headed to the village cinema for a conference with farmers and farming representatives.

Juan Carlos was not the only farmer kept in the dark about GMOs. "Why is it that the only information we get is from Monsanto?" Someone asked indignantly after the conference. Another farmer who had planted 100 hectares out of 600 with GM soya wanted to know if horizontal gene transfer might contaminate his new crop if he switched back to non GM soya. I confessed I did not know, because no one had looked. Adolpho Boy thought that would be a good topic for scientific investigation.

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Slaving Science and Society with Public Subsidy

The corporate take over of science is about to enter a new phase in Europe. EU's scientific research budget is being carved up by industry. The money is to be wasted in subsidising failed and failing corporate technologies, many of which are clearly not in the public interest and also hazardous, such as nuclear and GM technologies. And, it is going to commit us to even more of the same. Our governing representatives have yet to recognise the key importance of science policy.

Dr. Mae-Wan Ho urges everyone to alert Members of the European Parliament.

The European Union is about to finalise Framework VI, its new funding programme for public research in member countries for the period 2002-2006. I was invited by the Green Party to the Green Research Forum (June 6) and again to a Public Hearing in the European Parliament (June 26).

The Public Hearing was a contradiction in terms. There was no sign of any ngo, none had been invited, and the hall was filled with industrial lobbyists. I was asked to speak on 'Food safety and health risk', a minor area designated for funding. The major areas all had their advocates: Prof. Andrea Ballabio (Telethon Institute of Genetics and Medicine, Napoli, Italy) for 'Genomics and biotechnology for health'; Prof. Jean-Pierre Goedgebuer (Laboratoire Optique Pierre-Michel Duffieux, Besancon France) for 'Information society technologies'; Dr. Antonio Correia (CMP Cientifica, Spain) for 'Nanotechnologies, intelligent materials and new production processes'; Dr. Manfred Fuchs (OHB-System, Bremen, Germany) for 'Aeronautics and space'; and Prof. Lena Senneby-Forsse (Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning) on 'Sustainable development and global change'. Each argued why their particular area should have a bigger slice of the cake. A seventh area, nuclear energy, did not need an advocate because funds have been earmarked for it.

There were two more speakers addressing the new 'instruments' of funding. Dr. Roberta D'Orazio (Unindustria, Padova, Italy) spoke on behalf of SMEs (Small and Medium Enterprises), as it became clear that Framework VI is going to leave them high and dry. Prof. Alan Wilson (University of Leeds, UK), an ex-Vice Chancellor of a University, claimed to speak on behalf of academic scientists, and was quite happy about the new arrangement.

The public has had little say in deciding the structure of Framework VI, and Framework VI itself makes no provision for promoting critical public understanding of science, which would enable the public to have a say in deciding on research areas that should, or should not be funded. The new 'instruments' include 'networks of excellence' linking top research institutes and 'integrated projects' involving public/private partnerships, all designed to benefit big corporate science, freezing out SMEs, small innovative research groups and individuals, and certainly any dissenting minority. One timid voice was raised from the floor to Prof. Wilson, who reassuringly replied that perhaps the big networks and big groups could be allowed to 'sub-contract' research to small groups and individuals. In this manner, all dissenting voices and innovations will well and truly be silenced or else brought under economic control. This, at a time when we are in dire need of independent science and scientists simply to protect us from all the failures, and to anticipate and repair the damages that have been done.

The total budget is 17.5 billion Euros, an increase of 17% over the previous Framework V. Although this funding programme constitutes only 5% of the research budget of EU countries overall, it plays a crucial role in structuring European research and in defining the overall aims of

European science. It makes no bones about the corporate agenda. The goals are to enhance Europe's global "competitiveness", to boost "European added value", and, "Business should be publicly funded if this provides incentive to carry out high-risk or long-term research which could be unprofitable in the short term." [1]

The proposed carve-up is as follows: 'biotechnology for health' and information technology are to be allocated the lion's share: 16% and 27% respectively; nuclear energy and nanotechnology each receives about 10%; aeronautics and space gets 8%, food safety and health risks 5% and sustainable development and global change 13%.

An eighth area, "anticipating the EU's future scientific and technical needs", allocated 13% of the budget, is meant to restore plurality and flexibility. But neither the themes nor the precise requirements and instruments are specified, and it could be yet another way to give corporate science more bites at the cake.

Although the Framework contains statements about ethics and supporting women in science, there is no designated research budget or means of implementation. Ethical considerations, like gender equality and sustainability, ought to be criteria that apply across the board to all research, as stressed by MEP Paul Lannoye and many others.

Is Framework VI socially accountable? This question isn't even asked, and no MEP has asked it either. The representatives of civil society have yet to realise how important science policy is, and why we need democratic public participation.

'Genomics and biotechnology for health' reduces practically every human disease to genes, when everyone knows that the overwhelming causes of ill health are social and environmental. Poverty is a big killer, especially with infectious diseases, so too is environmental pollution from the hundreds, if not thousands of industrial chemicals that damage every organ system of our body including our genes. Yet, neither environmental medicine nor the etiology of infectious diseases and antibiotic resistance is being addressed in Framework VI.

Genomics is the culmination of reductionist biology, more specifically, reductionist medicine, which has already gone way beyond its usefulness and becoming a liability. Drug and antibiotic resistant infectious diseases have come back with a vengeance over the past 25 years. At the same time, there is a rising epidemic of iatrogenic diseases caused by approved drugs and treatments. Doctors are now the third cause of death in the United States, and the situation is similar in other industrialised countries dominated by the same reductionist model.

The world desperately needs a holistic model of health to support safe, effective and affordable healthcare. Antibiotic resistance, for example, could be solved by restoring ecological balance that turns pathogens non-virulent, and also by the many herbal medicines used in traditional healthcare systems that are now found to have anti-microbial activities (see 'Radical solutions needed for antibiotic resistance', this issue).

Public finance for genomics is a blatant example of governments diverting huge sums of tax money to bail out an industry already in trouble over GM crops, and now in danger of being driven bankrupt by the human genome. But the money allocated to genomics is dwarfed by the amount that information technology (IT) is getting, just at a time when the IT bubble has burst and a severe slow down is spreading across the globe. The Green Party rightly wants "no subsidy in the area of mobile phones".

It is in supporting nuclear energy research that the Framework gets the prize for subsidising failed corporate science. Most of the nuclear energy research budget is in fact allocated to EURATOM. This is a hangover from the EURATOM treaty of 1957, widely condemned as anachronistic, and should have been replaced with an agreement on solar energy long ago. Han-Josef Fell, Green Member of European Parliament (MEP) leading the critique of Framework VI, pointed out that the money spent on nuclear energy is more than ten times that for all the other energies put together, and yet it is responsible for just 5-7% of our energy supply. "It is the biggest flop!" he said.

Europe has yet to have a coherent energy policy. With the security of supply a growing problem, fossil fuel is a clear loser, as oil runs out in 50 years, and it obviously contributes massively to CO₂ emission. A comprehensive Framework V report had already concluded that it is feasible to switch from both nuclear and fossil fuels to renewable sources completely in 50 years, if accompanied by measures to stop wastage and to reduce energy use. Renewable energy sources can be brought to the market by 2010, or even sooner. Nuclear energy from fusion will take at least 50 years, if it ever works at all. Instead of abandoning nuclear energy, new fission possibilities are being promoted, when we are still plagued with existing nuclear waste problems. Not only cancers, but also immune damage are now linked to low dose ionising radiation, warns Green MEP Nuala

Ahern. The Framework VI budget allocation for renewable energies is estimated at one-seventh of that of nuclear energy.

Germany legislated for increasing renewable energy cover from 5.9% to 12% by 2010. When it became law in 1999, renewable energy use increased by 1.1% in a single year. At that rate, the target will be reached long before 2010. This shows what governments can do to encourage the industry.

'Food safety and health risks' appears to be addressing public concerns. It aims to improve traceability of chemical, micro-biological and GM contaminants of food as well as research their human health impacts. But most of these are routine tests that should be required for regulatory approval, and no real science is involved. So long as the regulatory approval system is not improved, the threats to health and biodiversity remain.

Also included in 'Food safety and health risks' is the production of 'healthy' foods through biotechnology as well as organic farming. GM has already been strongly rejected by civil society, and widely acknowledged to have failed, even by the corporations. One by one they have announced they are giving up GM crops and concentrating instead on genomics and marker-assisted selective breeding. Unfortunately, researchers in our public institutions are persisting in developing not only GM crops, but GM fish, GM insects and GM bioreactors for pharma-ceuticals and xenotransplantation and even GM meat is coming to our dinner tables. It would really be a sin to subsidise this failed, unwanted and hazardous technology. The scientists involved are going against the wishes of the people, they are also willfully ignoring and dismissing evidence of hazards.

'Sustainable development and global change' focuses exclusively on technology and then only within the framework of climate change. It does not address the social causes of climate change nor the potentially devastating effects on displacement of human populations and on health. There is also no support for the conceptual, scientific basis of sustainable systems. Prof. Lena Senneby-Forsse rightly argues for a much wider view and bigger budget.

There is still a chance to influence the final carve up. Please do it now!

(For a complete text of my contribution to the 'public hearing' see "Is Framework VI socially Accountable?" website www.i-sis.org; for ISIS' suggestions on areas of research that ought to be funded, see "The Human Genome is A Big White Elephant", this issue)

1. See *Evaluation of the Commission's proposal for the 6th EU Research Framework Plan and for research within the framework of EURATOM*, On behalf of the Bundestag parliamentary group Bündnis 90/DIE GRÜNEN, Hans-Josef Fell MdB, May 2001.

GM Cotton in India Exposes Rot in Science

*The scientific echelons of India have been bulldozed by 'unscientific claims' to thrust an untested and unproven technology onto gullible farmers. **Devinder Sharma**, food and trade policy analyst, ran an internet campaign which succeeded in delaying the commercial growing of GM cotton in India. He is calling for serious instrospection in the scientific community, with regard to their role in possible cover-up on behalf of private companies, before the nation loses faith in scientific claims. Like the politicians, who have lost touch with the masses, agricultural scientists too have lost touch with the farmers. The line between science and industry is increasingly blurred, with the scientific institutions becoming the mouthpiece for industry.*

After three years of 'satisfactory' field trails and experimentation, we were told, the Department of Biotechnology (DBT) was ready to seek approval to commercialise the first GM crop in the country. The stakes were very high, as commercial release was being sought by Maharashtra Hybrid Seeds Company Ltd (Mahyco), the Indian subsidiary of the multinational giant Monsanto. A green signal was given by the Genetic Engineering Approval Committee (GEAC) of the Ministry of Environment and Forests to the controversial Bt cotton, which has a gene inserted from a bacterium *Bacillus thuriangiensis* (Bt) to act as a 'natural' insecticide.

Intensive cultivation practices and indiscriminate use of conventional as well as fourth generation pesticides such as synthetic *pyrethroids* have created resistance among some of the key pests, including the American bollworm. Dependence on chemicals has been so heavy that farmers often resort to a cocktail of several pesticides, and it is not uncommon to spray more than 30 times per season. And as the crop fails because of weather conditions and/or pest resistance, an increasing number of farmers have been known to consume the same chemicals to end their lives and escape the humiliation of mounting debts. More than 2000 cotton farmers in Andhra Pradesh, Karnataka, Maharashtra and Punjab have committed suicide in recent years.

For the scientists, the easy way out is to take another equally harmful route: incorporating a toxin within the plant so that when the American bollworms feed on the crop, they are killed. It sounds perfectly logical, but what does it actually mean for the environment and the farmers?

About 162 species of insects are known to devour cotton at various stages of growth, of which 15 are considered key pests. The most dreaded is the American bollworm. Over the past few decades, the pesticides industry, aided and abetted by the agricultural scientific community, has made us believe that spraying ever more potent chemicals is the only answer. The result is that the insect pests have developed resistance to all kinds of chemical and pesticide cocktails.

We are now being told that GM cotton is the only solution to the growing menace of pesticide resistance. What we are not told is that the Bt cotton is unsafe for the environment as well as animal and human health (see "Monsanto GM cotton not safe" www.i-sis.org), and that the introduction of Bt cotton will push the country from a 'pesticide treadmill' onto a hitherto unknown and dangerous 'biological treadmill'. What will happen when the insect develops resistance to the Bt cotton? Will we introduce scorpion genes into the plant then, as has been done in maize in the United States? And what about the biological pollution that Bt cotton will unleash? After all, unlike the chemical molecule, the alien gene that flows into the nature is a living form and has the potential to multiply.

The DBT tried to address those issues by asking Mahyco-Monsanto to conduct experiments over the past three years. The first trials were held in 1998, and after approval came from the Monitoring and Evaluation Committee (MEC), the results were put before the Review Committee for Genetic Manipulation (RCGM), and finally before the GEAC. Next year, in 1999, the crop was sown two months late due to delayed permission from the State governments. And yet, the results reportedly showed positive performance. Both the committees, were said to be 'satisfied'. The next year, the crop was sown late by three months and again, the two committees approved the results.

The process and manner in which the approvals were granted is completely unscientific. If the crop can be sown two to three months late and yet provide a higher yield, why doesn't the Ministry of Agriculture advise farmers to sow the crop late? Also, if an exception can be made to Mahyco for conducting the experiments in a slip-slop manner, why shouldn't the same criteria be allowed to thousands of agricultural scientists working in the universities? Moreover, the suggestions by the Indian Council for Agricultural Research (ICAR) for some of the environmental tests to be undertaken on a long term basis, were also deemed to be satisfied on the basis of data collected for only one crop season. All these glaring flaws in monitoring, evaluation and approval certainly raise questions regarding the competence of these two committees.

It has been repeatedly said that Bt cotton is not a solution to the entire problem of pest infestation in cotton, but is a part of the integrated pest management (IPM). But where is the IPM package, into which the Bt cotton fits? In fact, the Ministry of Agriculture has no programme that encourages IPM in cotton. When the GEAC was told of an experiment in Madhya Pradesh (in central India) wherein 1,100 farmers were growing cotton without chemicals and still getting higher yields, scientists present in the meeting said that they had never heard of it. The tragedy is that like the politicians, who have lost touch with the masses, agricultural scientists too have lost touch with the farmers.

Scientists are keen to jump onto the biotechnology bandwagon. With the public sector being starved of research funding, and with research increasingly getting into the hands of private companies, scientists too have to join the chorus to remain employed. The line between science and industry is increasingly blurred, with the scientific institutions becoming the mouthpiece for industry. As a scientist, I am greatly dismayed to see the slow and steady decline of scientific institutions and still worse, the manner in which the present leadership in Indian science is refusing to stand up and be counted.

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Patents Choke Agricultural Research

*Agricultural research is increasingly in the hands of private companies, and patent restrictions are blocking the free exchange of seed and technology. Research in public institutions is being delayed or abandoned, raising fears that crop development for poor countries will be neglected. **Angela Ryan** reports.*

In the United States, about 45% of plant breeders at universities said they had trouble getting seeds from private companies needed for their research. Dr Samuel H Smith, the former president of Washington State University said "the things that give us a safe and healthy food supply are slowly being eroding - it's a slow death!"

Companies are focussing on genetic engineering because it is easier to protect engineered crops with patents. But it is uncertain if biotechnology will improve crop output the way classical breeding has. "I am worried we are getting off the proven thoroughbred too quickly to get on a highly decorated donkey," said Dr Margaret Mellon of the Union of Concerned Scientists.

Concern heightened in January when two companies announced they had determined the genetic code of rice, years ahead of the government effort (see "Syngenta Takes Over Rice Genome", ISIS News 7/8). Dr Rod Wing of Clemson University asked, "how can a company own the most important food crop in the world? In Asia rice is like a religion. To own a religion? Can you do that? I don't think so!"

According to the International Food Policy Research Institute in Washington, growth in public spending on farm research has slowed significantly. In industrial countries, public spending has been growing 1.8% per year whilst private spending is growing 5% annually. The US dept of Agriculture's research budget has barely moved in real terms for two decades. In the US, private research spending surpassed public in the early 80s and the gap has since continued to widen. By 1994, two thirds of American plant breeding was in private hands. Britain has privatized some government agricultural research centers and some developing countries have cut spending.

"Plant breeders in the public sector have essentially vanished", says Dr William F Tracy, professor of agronomy at University of Wisconsin. The biggest worry is that improving crops for the developing world will falter due to low profit potential, as with drugs.

In some cases, companies allow academic scientists to use their technology in return for commercial rights to all results. Companies are "capturing the output of public sector research" said Dr Gary Toenniessen, director of food security at Rockefeller Foundation.

One major university in the US has just completed an internal audit, which recommends it runs a check of the US Patents and Trademarks Office (PTO) databases to identify whether any employee has filed patents independently of the University. It is looking for a company that would be able to carry out such analysis.

As companies and universities patent improved varieties, developing nations are becoming increasingly reluctant to share seeds. Barley from Ethiopia imparted virus resistance to California's crop in the 1950s without compensation. Such free gifts are set to become a thing of the past.

Meanwhile at the biotechnology building of the USPTO, new patent applications are falling off shelves, piled into corners and crowding every desk. Companies are going mad to win patents, seen as the new American gold rush. The government has no control over whether patents are hoarded or shared. Arthur Caplan, who serves on the ethical advisory board of Celera, says "we have this space shuttle biotech but its navigation system is Santa Maria level in terms of ethics".

For instance, some governments and civil society groups mistakenly assume that the threat of "Terminator" is gone. But Syngenta, the world's largest agribusiness controls at least six terminator patents and a host of new patents on GM plants with defective immune systems, which may force chemical dependencies in agriculture and farmers into bio-serfdom. Products developed under these patents are moving closer to commercialization.

Relationships between the PTO and industry are becoming increasingly incestuous. According to Peter DiMauro, a former patent examiner, many people who work at the PTO "use it as a way station, until snatched up by industry". In addition, the PTO hosts quarterly talks inside its headquarters with industry to discuss patenting policy. These sessions are described in the PTO's corporate plan as "focus sessions with customers to determine their needs and expectations".

The PTO collects its budget solely through application fees. It was recently designated as one of the only two "performance-based" government organizations. "Like any other business that wants to be competitive in the 21st century marketplace, we recognize the importance of quality and customer satisfaction."

The US PTO has no stake in serving the public interest and the law needs to change. But congress takes a hands-off approach to patents on life, arguing 'what is good for biotech is good for America'.

Sources: The Green Revolution Yields to the Bottom Line, By Andrew Pollack, *The New York Times*, May 15th 2001. Intellectual Property Enforcers on the March, by Freida Morris, forwarded by the Edmonds Institute 20th April 2001. Gene Blues - Is the Patent office prepared to deal with the genomic revolution? By Nicholas Thompson, *Washington Monthly*, April 2001. New terminator patent goes to Syngenta -wake up call for CBD's scientific body meeting in Montreal, News Release RAFI March 12th 2001.

Monsanto Coming to British University

Monsanto, the world's leading producer of GM crops, has held meetings with a British university over potential support for research on GM food.

Nottingham University recently founded the Institute for the Study of Genetics, Bio-risks and Society. Part of the institute's research includes the study of "public attitudes" to GM crops; as though the worldwide rejection means nothing!

In an e-mail message to staff, marked "strictly confidential", Robert Dingwall, a sociology professor who heads the institute, states: "I have been asked to a meeting on March 1 arranged by the vice-chancellor with representatives of Monsanto. They are interested in a briefing about IbiS [the institute]. However, it would be naive to assume that there is no possibility that this could lead to discussions about financial support."

Nottingham already attracted widespread condemnation recently when it accepted £3.8m from British American Tobacco to fund the study of ethics. A number of staff has quit the university in protest, including Professor David Thurston, a leading cancer researcher, who took his team to London University, while the Cancer Research Campaign dropped plans to raise £1.5m for new university buildings.

A university spokesperson confirmed Nottingham had held talks with Monsanto, but only about "scientific innovations". Monsanto denied it was in talks about funding.

Monsanto runs 26 farm-scale trials in Britain, including two at Meden Vale in Nottinghamshire. The University has been at the forefront of GM food science. One of its professors produced the first GM food, a GM tomato.

Source: "University in talks with GM food firm", by Robert Mendick, *The Independent on Sunday*, 1 July, 2001, <http://news.independent.co.uk/uk/environment/story.jsp?story=81147>

GM Is Kidstuff

Desperate biotech corporations are after our kids. They are sponsoring a contest to "create the Food of the Future" for a chance to win a \$10,000 college scholarship!

The contest is open to kids 8-12 years in the US, and only with parental consent. And just for entering, they'll be sent a free copy of *Look Closer at Biotechnology* "filled with fun ed-ucational activities".

"What can biotechnology do?"

"Imagine this: you go to the doctor for a check-up, and instead of giving you a shot, he feeds you a banana!....

"Does this sound like a dream come true? ...

"In some poorer parts of the world, millions of kids can't even afford to go to the doctor for shots that could save their lives. For them, this banana could mean much more. Giving them foods made with this banana would be easier than giving them a shot, and that could mean a longer, healthier life."

The Washington based Council for Biotechnology Information sponsoring the contest was founded in April 2000 by leading biotechnology companies "to create a comprehensive communication campaign about biotechnology". The council claims to be "committed to providing objective, balanced information to help you better understand and appreciate the benefits biotechnology offers, as well as to encourage informed debate about the issues it raises."

The founding companies are Aventis, BASF, Bayer, Dow, Dupont, Monsanto and Syngenta. Two trade associations, the American Crop Protection Association and Bio-technology Industry Organization, also are members.

Check it out:

<http://www.whybiotech.com/en/whoarewe/default.asp?MID=2>

Thanks to Norfolk Genetic Engineering Network for supplying the information <http://www.ngin.org.uk>.

People Power and Open Science Won the Day

ISIS played a part in helping the local community of Mathry remain GM-free. Here's an excerpt from the diary of Dr. Mae-Wan Ho.

"We shall meet at the car park of the Farmer's Arms," said Gerald Miles, with a mock conspiratorial air, his dark eyes twinkling beneath bushy eyebrows in the twilight. A dark stocky fellow of medium build, he has the air of someone in the know and in control.

It was after a long lively public meeting at the City Hall, which drew an audience of more than two hundred from around the area. That was the third talk that Brian Goodwin and I had given in less than twenty-four hours. We spoke first to the farmers the previous evening, and then to the

politicians and local representatives in the morning. And all through that bank holiday weekend in May, the sun was shining gloriously on Mathry, Pem-brookeshire of Wales.

The local community had organised several protest actions over the past weeks, all well reported in the local media, and everyone was alert and drawn much closer together as a result. There was tension, but also a carnival-like atmosphere. The landlord Tony Marlowe, however, stood his ground on the intended field trial. Nevertheless, he had sent word via his neighbour and prime adversary, Gerald Miles, to invite the visiting scientists to give him a private tutorial on GM.

Gerald runs a small organic farm right next to Castle Cenlas, owned by Tony Marlowe, where 14 acres have been designated for the trial of Aventis' Chardon LL GM maize. Gerald converted to organic several years ago. "For the first time in my life, I am actually enjoying being a farmer," he told us. He stands to lose £50 000 if he loses his organic status from GM contamination.

Another very concerned person was Robert Jones, representative of the 22 local beekeepers. Robert had spoken up in the seminar that morning, pointing out the great distances bees travel, how maize pollen could be collected by bees because maize flowers late in the season when few other plants are in flower. GM contamination is not the only problem, the other problem is the spread of antibiotic resistance to bacteria that infects beehives. Foul brood disease must be treated with antibiotics including tetracycline and ampicillin. Chardon LL has an ampicillin resistance gene that is not active because it has lost the promoter, but government scientists had already warned that it could be reactivated by genetic recombination.

Gerald has tried his best to persuade his neighbour to call off the field trial, including offering to lease his neighbour's land to farm organically, but Marlowe had refused. It would be hard to match the £1400 per acre that Marlowe would receive from the government in any case. "How do you know the GM seeds haven't been planted already?" Someone asked. "Oh no," Gerald said, another twinkle in his eyes, "the phones will be ringing throughout the land."

Ian Panton, Chair of the St. Davids Peninsula Tourist Association, a tall gangly and affable fellow, was one of the key players in the local campaign to keep Wales GM free. He drove the scientists to the car park, but no sign of Gerald. Then, a car suddenly materialised in front of us with its headlights on, and out popped the man himself, together with a young woman, Moyra Charles. Moyra, a local solicitor, has volunteered to represent the farmers free of charge, in case they have to resort to the courts to argue the loss of earnings due to genetic pollution of their crops.

"Tell him all you have told us," Gerald advised, "Tell him he will contaminate his land. And be sure to show him your overheads." Thank goodness I got my overhead transparencies organized recently, which I now carry around in a ring binder. They go down extremely well with all concerned, apparently because then they know you are a real scientist.

And so we drove on. By this time, night has fallen. Ian drove with breakneck speed down the narrow country lanes, regaling us with stories about what goes on in the Department of the Environment Transport and the Regions (DETR), which is paying out £3 million of taxpayer's money for the field trials and giving formal approval to the sites selected. A certain civil servant in the DETR has made it his job to withhold information and correspondences from the Environment Minister, just like the sitcom, "Yes Minister" which was extremely popular in the Thatcher era.

Ian was a member of a local delegation that met with Michael Meacher, Minister for the Environment. That was when the Minister discovered the required minimum 10-day notice for the field trial had not been given to the local residents. "Michael Meacher was not pleased, "Everything should come to me", he said to the 'microminion', looking him straight in the eye, sending him away skulking," Ian recalled with glee, as he made another wide swerve across to the lane of the oncoming traffic. Ian used to be a pilot in the RAF, and has never got used to line markings on the roads.

We passed a car parked next to a hedgerow. Ian told us they were part of the 24 hour vigil that the local residents were mounting. I strained my neck to look over the hedge and could just see the rolling field where the Chardon LL would be planted. On the far side, yards away from the field, is a river inhabited by otters, an endangered species, certainly to be harmed by the glufosinate herbicide that would be sprayed on Chardon LL, engineered to be glufosinate-tolerant. The Welsh Wild Life Protection would compensate farmers for that, Ian said, another angle to be explored in persuading Marlowe to give up the trial.

We arrived in front of a Georgian mansion. The full moon was a ghostly galleon impaled upon the bare trees, as Ian unloaded the portable overhead projector from the car boot, together with the rolled up screen, looking too much like a dangerous weapon. It reminded me of the letter that Aventis wrote to the local community to protest that they had not been invited to our debate, which was untrue; and also demanded protection for the 'intimidated' farmer.

We knocked on the door, and again, but still no reply. Gerald pushed lightly at the door to find it ajar. "It's a trap!" I whispered. By this time, there was motion from inside. A white-haired man of robust build came to the door, followed by his partner, Jill Chambers. The atmosphere was relaxed, even friendly. We were led to the living room and offered drinks. I accepted a glass of red wine, as Ian and Gerald busied themselves setting up the overhead projector and screen.

"There is such a lot of misinformation around," Gill complained, "Mo Molem writes to tell us one thing, then Michael Meacher says another. We are not getting all the information." I wasted no time in getting down to the tutorial, but there were constant interruptions and questions from Marlowe and Chambers, both obviously interested and engaged, though somewhat on the defensive. They were particularly keen to know about horizontal gene transfer and how GM crops differed from conventional breeding. It must have been at least an hour before I stopped, and Brian Goodwin added important information on the toxicity of glufosinate. At the end, Marlowe congratulated himself on how he had never had a biological education, but had managed to understand everything.

We didn't really expect Marlowe and Chambers to change their mind right then and there, but felt that we had given all the missing information they needed. It was two hours later when we set out on the road again. We found three cars parked at the vigil, and got out to exchange greetings. A biting wind was blowing in the night, but everyone was in high spirits.

Back at the Farmer's Arms, drinks were offered all round by the pub's owner, who was somewhat apologetic that he could not appear to be taking sides. Gerald told us in all earnestness how he loves his pigs and piglets, and how, since the foot and mouth outbreak, he was heartbroken to have to take them elsewhere and leave them for six hours before they were slaughtered. "They are so intelligent, the little piglets, they look into your eyes and see your soul!" A television crew had just interviewed him and his pigs. "Next time," I said, "hold the little piglet, it's the image of the new man. The women will go wild."

That was Saturday. Sunday morning, Ian took us for a windy boat-ride from St Justinian around Ramsey Island, spotting seals and seabirds and exploring the caves and rock formations, a much welcomed reprieve before an interview with BBC Wales. The visiting scientists, Brian Goodwin, Angela Ryan and myself, went home very impressed with the community spirit that made everything run so smoothly and seem such fun.

The BBC Wales interview turned out to be crucial. I had said in my lectures that Chardon LL is illegal. I recalled how, at the public hearing objecting to Chardon LL last October, I told the presiding judge that it could not have passed the test for Distinctness, Uniformity and Stability (DUS) required for approval. A few days later, the Ministry of Agriculture Fisheries and Food put out a press release admitting as much. Apparently, the required test was two years in the field, but France had approved it on behalf of the EU based on one year only. The UK public hearing was suspended indefinitely. So technically, we have to suppose that Chardon LL is not legal. BBC Wales thought that was very significant, and the same day, the local media picked that up too, and very soon, even the politicians, who could not be persuaded before, took up the cause.

The following Wednesday, Tony Marlowe and Jill Chambers issued a press release calling off the field trial, blaming pressure from the local community and "a campaign of misinformation and disinformation"; by whom, they did not say.

UK GM Field Trials – A Tragi-Comedy of Errors

The 4th AEBC meeting on the UK GMO field trials exposed the ridiculous farce of the whole affair. The scientists behind the trials were ashamed as DETR and SCIMAC flung mud at each other and the environmentalists got the better of them all. Angela Ryan reports.

The Agriculture & Environment Biotechnology Commission (AEBC) gathered important evidence in February in Norwich about the UK farm scale trials (FSTs) of GM crops.

Four groups of witnesses were called to give evidence, Les Firbank, the scientific co-ordinator of the FSTs; Linda Smith of Department for the Environment Transport & Regions (DETR) & Brian Johnson of English Nature; Doug Parr of Greenpeace and Pete Riley of Friends of the Earth; Steve Smith and Daniel Pearsell from SCIMAC, the biotech industry body responsible for the trials.

Two camps - Pro GM and Pro Precautionary Principle, have now formed within the commission and each sat to the left and right respectively of the chairman. Everyone present was acutely aware that it was time to get down to the 'nitty gritty'.

Les Firbank was the first witness on the stand. He said the null-hypothesis of the FSTs is, "There are no differences between the effects of GM crops and non GM crops on biodiversity." He was immediately confronted with the fact that the trials are only looking at herbicide resistant GM

crops and therefore the null-hypothesis is too broad for what the field trials were actually aiming for.

Robin Grove White, an experienced environmental scientist, asked, "At the end of the trials, how are you going to interpret the results? It is unlikely to be clear-cut. You are monitoring a selected range, over a limited period. What judgements can you make in terms of significance, and how are you going to reconcile your indicators in different directions? Using statistical analysis there will be variable soil types, variable weather conditions etc. How are you going to handle that? Ecologically, there are other random effects and what are the large-scale, long-term consequences for weed bio-mass and seed banks. What are the potential scenarios?"

Firbank replied that there was "a need for transparency" and "all processed information will be publicly available on a website". Robin emphasized [for the record] that although the scientists conducting the FST will draw their own interpretations, the data will have to be subject to wider interpretation. Firbank agreed.

Sue Mayer flagged up the 'bias of the trials', pointing out that yield is not even being measured and that a sub-section of farms and farmers had been specially selected. She asked whether the trials could be easily audited for bias and whether anyone was monitoring how the farmer manages the two halves of the field, GM and non-GM. Firbank evaded this question too, and said the aim of the trials was to look solely at the most cost-effective weed management system.

The pro-GM camp, led by Phil Dale, asked "what if the FSTs find no difference between GM and non GM?" Firbank said the growing GM crops would ultimately be a societal decision, "these trials are the biggest studies so far conducted anywhere in the world!" But the fact that GM crops have been grown around the world without any environmental safety assessment is not a good selling point.

Organic farmer Helen Browning asked whether soil health was coming up on the agenda and raised the issue of horizontal gene transfer, and the fact that glyphosate kills soil microbes and fungus too. Firbank said soil research would be better done on a smaller scale. He did finally admit, "the trials are limited" and explained "we could not do it all and had to prioritize".

Firbank's morale fell and Phil Dale tried to rescue him by prompting, "But non GM crops are just as bad for the environment, aren't they?" Firbank replied, "The evaluations are specific to GM products". He said he would welcome more research, especially research that takes into account organic farming, but the trials had to fit into a national context (except the national context is changing rapidly, with accelerated growth in the organic sector). He added, "in principle there are radical effects on biodiversity from the widespread practice of autumn sowing, now typical in all conventional regimes". He agreed "all management regimes should be biodiversity linked" and "soil studies should be done before large scale field releases of GM crops go ahead".

Next on the witness stand was Linda Smith of DETR & Brian Johnson of English Nature. Smith told the commission that DETR needed the evaluations and were on target. They had 60-75 independent sites offered by SCIMAC. She stressed that as far as the DETR is concerned, the trials are only looking at the impact of herbicide resistant GM crops on biodiversity. *Effects on human health are not included.* She explained SCIMAC had determined the segregation distance, not DETR. DETR had reviewed the situation and new measures would be announced later that day, which they were. She stressed "if GM crops are ever to be grown commercially, it is very important to put in place considerable regulation in order to protect the integrity of nearby crops."

Brian Johnson agreed assessment was necessary and there is a major gap in safety assessment regarding human health. He said gene flow is not a big issue for English Nature as they don't use any herbicides. "The trials are not going to tell much", especially regarding other types of GM crops, but they do fill a gap in regulation, for nothing is known about the effects of any GM crop on biodiversity. English Nature fear more intensive weed control will simply make matters worse for farmland biodiversity, which is the most at risk. The only way English Nature can see any benefit in the trials is as just part of a fuller assessment of intensive agriculture.

DETR was then questioned as to why it had ignored beekeepers and organic farmers. Smith said how very difficult it is to reach consensus with diverse groups. The government is "holding back on commercialization" until the trials are over. She admitted, "things should have been more properly assessed, reviewing all the issues in respect to safety." She then added, "The Chardon LL hearing has raised several safety concerns for government regarding human health."

Helen Browning asked for studies on soil health. Smith said "the issues of horizontal gene transfer and soil health are being put to ACRE, we are asking them [.....] do you understand the risks?" Smith said that soil health is under review in DETR, "considering additional research more

effectively done in different ways”, adding “the issue of gene flow is not easy to resolve, it is a very difficult question.”

Ironically, she went on to claim that the aim of DETR is to “do as little damage to the environment as possible and meet the biodiversity targets for Britain.” And many other issues have to be resolved, especially regarding human health. There is “a large number of unknowns yet and we’ll have to wait and see” she said. She admitted, “The government’s got into a very bad position due to bad decisions taken early in the process.”

Pete Riley of Friends of the Earth and Doug Parr of Greenpeace were next. Riley was incensed. He said, “the comments from Linda Smith go to prove our political analysis is correct!” The political process must put science into context and “we need a more advanced debate about what sort of food people want to eat”. He said the government is “completely out of touch with public opinion on these issues”. In public meetings across the country, “the overriding emotion is anger!” BSE will shape the way we regulate food from now on. Gone are the days when government “decides, announces and defends”. The public must be consulted early on and we must have a broad discussion as to whether we even need GMOs or not. Doug Parr strongly supported this view, adding “we need to look at the trajectories; where are GM crops taking us”.

Phil Dale asked, “if we allow consultation with the public, how can we protect our ability to innovate?” Doug Parr said science and technology shape all our lives, therefore it is wrong to leave it all up to science and technology committees. Riley pointed out that the government would have gone ahead and proposed Chardon LL for spring planting this year, which was “totally illogical and not credible in the eyes of the public”. The government is seen to be “motoring ahead, preparing the grounds for commercialization”.

Matthew Freeman asked them what their specific concerns were. Parr replied “the unpredictable nature of GMOs” and “the mixing of genetic material across wide species barriers”. Greenpeace want sustainable agriculture. Riley said the trials are asking the wrong question, they are comparing two intensive systems. There are bigger ethical issues too, that have not been debated at all; this is unacceptable. He said the issue of patents is a major concern that “should have been debated along side the FSTs”. Food safety is another, “Is it safe to eat?” In the past “we’ve launched into technology without testing it properly” and we should not make the same mistake with GMOs. We must have a strict regulatory regime that includes liability and “ensures industry takes responsibility” when things go wrong. People nowadays want quality assurances, genetic ID testing of GM free food “is very difficult and messy”.

Freeman pressed for “specific examples of risk, published in scientific journals”. The two witnesses cited a couple of examples: Monsanto’s GM soya with stem cracked open, the unpredictability of GM, and studies on Bt crops showing active Bt toxin leaked into soil, both published in *Nature*.

At this point, I couldn’t figure out whether Freeman was calling their bluff or was genuinely ignorant of GM safety concerns. Freeman is the only molecular biologist on the commission, coming from a background in *Drosophila* (fruitfly) research.

After the meeting and in front of another member of the commission, I asked him, “You’re not really that unaware of the safety concerns are you?”. His reply was, “I do not believe there are any safety concerns”. I had to remind him that as a scientist he must be impartial and take account of evidence. He repeated, “I do not believe genetic engineering is dangerous but in some cases the effects may have harmful consequences.” I replied “Yes, like insertion mutagenesis or insertion carcinogenesis for instance?” He agreed.

I then raised the safety issue of the CaMV promoter, the fact that it has a recombination hotspot and is a very strong universal promoter, having functional activity in human cell lines, yeast, *E.coli*, *Xenopus* (a frog) as well as all plants. He asked “Are you sure you are not getting mixed up with the CMV promoter?” I said “No, not the cytomegalovirus promoter, I’m talking about the cauliflower mosaic virus promoter, used in practically all GM crops”. He looked surprised and said, “I didn’t know it was active in human cells.”

Next came the SCIMAC witnesses, who were made to eat humble pie. They said they had ignored organic farmers and beekeepers because they only “respond to new evidence”, but they “do want a continuing dialogue”, although “this technology has to co-exist with other agriculture”. The importance of “openness and transparency” was offered repeatedly, and statements like “SCIMAC published full details of all the sites, exceeding regulatory requirements”.

Sue Mayer asked what SCIMAC consider to be ‘valid objections’. Steve Smith launched into a rambling diatribe about how “we are all in a changing environment” and “many changes are taking place in society, economics and the environment”. He has been reading books on the environment and even mentioned the importance of our “ecological footprint”.

Apparently SCIMAC have “graphically demonstrated con-sideration for the views of the public”. But the two men then went on to confirm our worst fears by saying, “the FSTs are not a safety trial nor an impact assessment, they are just looking at the impact of GM herbicide resistance crops on biodiversity, as this was missing from the regulations”.

They offered plenty of excuses like “industry had done nothing wrong” for “it only has to satisfy regulators” and “remain competitive”. Steve Smith took some credit, “these FSTs have opened the debate up to the public and this must continue”. On liability, he threatened “we need to think about the liability of these products to other industries, not just environmental liability”.

Having pushed the idea that the FSTs are an example of how industry “is prepared to be proactive”, Steve Smith admitted, “we haven’t reached our conclusions yet”. Industry only has to meet the requirements of the new EU Directive but “safety concerns still remain” and “SCIMAC is involved in looking at impacts outside the bounds of regulations”.

Pearsell said industry “can’t get away with anything nowadays” reiterating Steve Smith, “we haven’t reached any conclusions” and “everything is not wonderful”. The two men, when finally cornered, both agreed there is a need to “reduce risks to human health and safety” and “return to sound science”. But that can only mean *no field trials should go ahead!*

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Pro-GM Royal Society Fellow Named in Libel Case

The High Court in London has been told that a letter from Prof. Anthony Trewavas, well-known champion of GM and critic of organic agriculture, contained a series of unfounded allegations about Greenpeace and Lord Melchett that should never have been published. Jonathan Matthews reports.

The Scottish newspaper, the *Herald*, has just had to make a public apology for a series of allegations that had “no foundation” and “should not have been published”. The High Court in London was told that the allegations were contained in a letter from Anthony Trewavas, Professor in Plant Biochemistry at the University of Edinburgh. In addition to the public apology for publishing the letter, the *Herald* has also had to pay undisclosed damages and all the legal costs arising from the libel case [1].

The libellous allegations concerned the campaigning over GM foods of Greenpeace and its former Director, Peter Melchett. The letter in question alleged that Greenpeace was profiteering through corporate “shakedowns” while its Director manipulated the market to line his own pocket. So how on earth did one of Scotland’s leading dailies get into such a scrape? The most obvious explanation for the paper’s failure to apply its normal standards of editorial scrutiny is, of course, the confidence they may have placed in Prof. Trewavas. Trewavas is not only UK Government advisor on GM, but also a leading Fellow of the Royal Society, the very body that has sat in judgement on the issue of journalistic accuracy in relation to issues like the GM foods debate. Indeed, the Royal Society has issued guidelines for the press on science-related matters, and even provides the media with a directory of experts to ensure that journalists get their stories right [3].

Back in May 1999, following the Puztai affair, a House of Commons Science and Technology Select Committee Report first called for the media’s science-related coverage to be governed by a strict code of conduct for accuracy. The report began by quoting the Press Complaints Commission Code that, “newspapers and periodicals must take care not to publish inaccurate, misleading or distorted material”, and warned, “Editors must be able to demonstrate that the necessary steps have been taken”.

To help the media to do this the Royal Society published its ‘media directory’ in order to provide a list of scientists that journalists should consult to give them access to “the best source” of “advice and comment”.

Had the *Herald* letters editor consulted the media guide, he’d have quickly found Prof. Trewavas listed among the “Royal Society experts” on genetic manipulation and plant molecular biology [3]. So will the Royal Society admonish Prof. Trewavas and remove him from its list of journalistic advisors?

It hardly seems likely given the Royal Society’s own sorry history of media interference in this area: “We have contributed early and proactively to public debate about genetically modified plants...” [4]. Most notoriously, this pro-active contribution resulted in a front page story in the *Guardian* that suggested media manipulation of the GM debate has been critical to the RS’s own agenda [5].

Prof. Trewavas, in an earlier letter to US scientists, advised them to work with far right politicians like Jesse Helms, and to make full use of letters to the press. He further stated that there was a group of about a dozen leading UK scientists who were working together at the core of pro-

GM campaigning in this country. This letter was posted on a notorious pro-biotech e-mail list [6] that has been running smears against critics of GM - its most recent giving them a share in the blame for the September 11 terrorist attacks! It is from this list that Prof Trewavas now claims the material sent to the *Herald* originated.

But it hasn't been just the Royal Society that has given Prof. Trewavas a place of honour. The UK Government has also sought to benefit from his expertise by appointing him one of its advisors on GM [7].

And, apart from sitting on the UK's Advisory Committee on Genetic Modification (ACGM), Trewavas is also on the Governing Council of the John Innes Centre, the UK's leading plant biotech research institute. The Governing Council has responsibility for developing, together with the JIC's Director, the long-term vision of the institute [8].

The JIC's Director, Prof. Chris Lamb, has publicly expressed his concern at the "polarisation of discussion about agriculture", and declared it is part of the JIC's vision to seek to foster "balanced scientific discussion".

That vision cannot have been served by a member of JIC Governing Council reportedly accusing a non-profit public interest organisation of operating "various shakedown campaigns", receiving "big \$\$" from self-interested companies, and being susceptible to "well-placed pay-offs".

But then, Prof Jonathan Jones of the JIC has shown his commitment to "balanced debate" by calling GM critics, "the green mujihadeen", and posting material on the JIC website describing them as "anti-scientific", "bigoted", "mystical", "myopic" and prone to erupt with "green bile" [9]. So the JIC is perhaps even less likely to take action over Trewavas and the implications of the libel case than the Government, or the Royal Society.

And is it irrelevant to this world of double standards that both the JIC and many Fellows of the Royal Society have benefited hugely from investments from the leading biotech corporations? The Royal Society, via its fundraising campaign, has also received millions from corporations, including Rhône Poulenc and Glaxo-Wellcome [10]. And, of course, former food industry boss, GM enthusiast and biotech entrepreneur, Lord David Sainsbury, has given millions both to the John Innes Centre and to the governing Labour Party, who have given him a peerage and made him Science Minister [11].

1. The Herald's apology contained the following statements,

"On 3 November 2000 the Herald published a letter it had received from Anthony Trewavas, Professor in Plant Biochemistry at the University of Edinburgh.

"The letter alleged that Greenpeace campaigns had deliberately spread unfounded fears about GM Foods, so as to further the financial interests of Lord Melchett and Greenpeace, that Greenpeace accepted donations from companies and had inappropriate links with commercial organisations.

"The Herald acknowledges that there is no foundation in any of these allegations.

"The Herald recognises that the letter should not have been published and offers its apologies to Greenpeace and Lord Melchett for its publication. Lord Melchett has agreed to donate his damages to charity; The Herald has also agreed to pay the Claimants' legal costs."

<http://www.thescotsman.co.uk/uk.cfm?id=113633>

2. <http://www.i-sis.org/sciencewar-pr.shtml>

3. <http://www.royalsociety.org/news/index.html>

4. President's Address, The Royal Society Annual Review 1998-99.

5. <http://members.tripod.com/~ngin/rs.htm>

6. Tony Trewavas, "Advice to US scientists", Apr 18 2000, AgBioView..

7. <http://www.hse.gov.uk/foi/members.htm>

8. http://www.jic.bbsrc.ac.uk/corporate/About_JIC/gov_council.html

9. <http://members.tripod.com/~ngin/biospin.htm>

10. The Royal Society Annual Review 1998-99, p.26.

11. <http://members.tripod.com/~ngin/biospin.htm>;

<http://members.tripod.com/~ngin/rsfunding.htm>

<http://www.red-star-research.org.uk/subframe3.html>

Beware Corporate Takeover of Organics

While science thugs and Oxford dons are busy attacking organics in the public arena, the corporate paymasters may be engineering a takeover. Dr. Mae-Wan Ho reports on her visit to Inverness, Scotland, in August, where eleven have subsequently been arrested, and six charged, for placing

themselves in the path of the tractor planting GM seeds. The fields have been planted, but a 24h vigil continues to this day.

One of the arrested is Donnie Macleod, who manages a 600 organic box scheme for local inhabitants from his 130 acre farm, less than a hundred yards from the beach, where he also runs bed and breakfast, organic café and shop. Donnie is also chairman of the Highlands & Islands Organic Association representing fifty-six organic farmers and processors in the region, covering 4000 acres. Many are already contributing to the box scheme, and more are set to join in.

Like a large number of farmers in Britain, Donnie converted to organic quite recently, in his case three years ago, when his father became ill and he came home to the farm, and has since taken on his new life with great conviction and determination.

"We work on a food hierarchy system", he explained as we drove through some of the most beautiful countryside on the way to the rally, the sun was shining after weeks of rain, and the air was sparkling fresh. "We supply local produce as far as possible, but if the customer wants something that we don't have locally, we get it from the nearest supplier within the country, then in Europe; and if necessary, then the rest of the world."

That's a compromise, he admitted, because he takes minimising 'food miles' very seriously. The vast distances food is currently shipped from field to the plate contribute a lot to carbon dioxide emission and global warming. But it was important to accept that in order to win the customers he must respect their choice and meet their demand. Otherwise, they would be forced back into the hands of the supermarkets when local produce simply is not there.

Donnie is a wiry man of medium height, in his forties, perhaps, sporting red shirt and blue jeans. He has become a local celebrity, if somewhat reluctantly, in the campaign against the local field trials of GM oilseed rape in Roskil Farm at Munloch, Black Isle. He pointed to a hill on an island across the pristine Munloch Bay surrounded by greenery. What a desecration! I thought of the new bird species I had already spotted since I arrived, and the glufosinate herbicide runoffs into the bay...

A further two fields will be planted in Aberdeenshire farms at Daviot and Rothienorman. Both the Munloch and Aberdeenshire sites belong to a single family, a rather wealthy gentleman farmer, who has refused to listen or to give up the trials. People are overwhelmingly against the field trials, and they are very angry. There has been little or no public consultation. "The fields were planted last year as we were having the first public meeting," Donnie recalled. And it is not because the local government does not respect the people.

"The Scottish Highlands Council has voted against the field trials at least three times. All the Members of Parliament and Members of European Parliament have also declared themselves against the field trials." Has devolution of Scotland meant nothing? "No, we were told GM trials are not a devolved issue!"

The fields on the Black Isle are up wind of a burgeoning organic area. "They've done it on purpose, to destroy organic farming," said Donnie.

The mass rally attracted more than 500 of all ages. The march that preceded the rally was a sight to behold. The marchers, or rather, strollers, five or more abreast, extending easily a mile, snaked along like a festive dragon adorned with yellow balloons and bristling with placards and banners. Bagpipe and drums were playing, and children with painted faces, holding balloons, shaking rattles, skipping and dancing without a care in the world.

Was it a conspiracy that all the GM field trials in the UK seem to be near organic farms? Or is it just that organic farms are popping up everywhere? It is generally believed that the corporate agenda is to contaminate the organic produce so widely that people will have no choice but to accept GM. The European Commission's long-awaited regulations on labeling and traceability of GM food and ingredients adopted in July, sets a 1% threshold for 'unavoidable' contamination in products labeled 'non-GMO'. But the major organic certification bodies, such as the Soil Association and the Scottish Organic Producers Association (SOPA), are insisting on 'zero tolerance' for GM contamination.

Under pressure from the United States, there are already moves to raise the EU threshold even further to 5% contamination for GMOs that have been approved, and 1% for unapproved GMOs.

That is not all. Behind the scenes, there appears to be concerted machinations by corporate business and the UK government to undermine the existing organic certification controlled by farmers and primary producers, and to place it under the control of industry. The fear is that organic standards will become diluted, and further down the line, even GM may be accepted as organic.

An opening was created when SOPA's certification officer, Carolyn Beatty, resigned after many years of service at the end of 2000. The Board of SOPA was undecided as to whether to replace her and continue the certification scheme, or to sub-contract out certification to another organisation such as the Soil Association. SOPA has been negotiating with the Soil Association for a joint initiative, Organic Scotland. And the membership of SOPA gave a clear mandate to that at its last annual general meeting.

However, a wild card emerged from within the Board of SOPA, to subcontract the certification to Scottish Food Quality Certification Ltd (SFQC), a wholly owned subsidiary of Checkmate International (CMI). Neither SFQC nor CMI has had any special experience or qualification in organic certification. Their clients are the Supermarkets, and not the end users or farmers.

CMI's corporate stature is increasingly evident when it recently applied to UKROFS (the Government body that oversees organic certification) to become an organic certifier. It has already been granted this status.

In January this year, certain Board members of SOPA took it upon themselves to send a letter persuading the membership to vote for subcontracting to SFQC, before the full Board including the Chairman, had the chance to meet and discuss the options.

In April, SOPA announced it has subcontracted organic certification to SFQC, to the dismay of the Scottish organic farming community and the Soil Association.

It is not just the dilution of organic standards that's at stake. It is compromising a whole philosophy, a way of life committed to working with natural biological cycles, in soils, crops and livestock, to enhance the environment and avoid pollution; and to build up consumer trust. It is not primarily or only a business.

This could well be the most important science war of this century, and it will be fought in local communities all over the world, with people braving arrests and harassment.

Meanwhile, the *mangetous* peas and pale round *zuchinis* I bought from Donnie's shop were absolutely delicious. And I just bit into the orange beetroot, which is inspiration itself. I am told it is originally indigenous to Inverness. Wonder what else will grow in the Scottish Highlands, or here in my garden in London...

GM & Corporate Serfdom Official

We are witnessing the most outrageous acts of corporate theft and domination in history. At its heart is the manipulation of life-forms and the use of this technology to gain control over the food chain. Nick Papadimitriou charts the recent antics of Monsanto.

Giant agbiotech companies such as Monsanto are aggressively imposing a new form of serfdom on North American farming practices. By patenting both naturally occurring gene sequences and genetically modified forms of life, Monsanto can use aggressive lawsuits to ward off any potential rival. At the same time, insidious forms of surveillance and barely concealed threats are whittling away any options farmers have for getting seeds from other suppliers.

In April, Monsanto secured a "torpedo" patent designed to sink all rivals on antibiotic resistant marker genes used in practically all GMO crops [1]. This immediately resulted in court battles and a requirement for everyone who has made use of the technology to pay Monsanto royalty fees.

Monsanto has now launched another torpedo. A patent is pending on the complete genome of *Agrobacterium tumefaciens*. The bacterium is used in a vector system to insert new genetic material into crop plants and is a staple of the agricultural biotechnology sector. The patent has been pending for 18 years, as challenges were made by rival companies claiming to have invented the same. But the original technology was actually developed by non-industry academics on government funds [2].

Monsanto stipulated in its "New Monsanto Pledge", announced last November, that it was committed to sharing knowledge and technology in order to benefit people and the environment [3]. Working with a research team from the University of Richmond, the company purports to have placed the genome of *Agrobacterium tumefaciens* onto a 'public' database. However a perusal of the terms and conditions reveals that access is strictly limited to non-profit groups willing to enter into a licensing contract with Monsanto.

A similar arrangement holds with the Monsanto genome database for rice. The database registration agreement, available for download at Monsanto's devoted site, places severe restrictions on would-be researchers. Any patent resulting from information in the database has to be filed with Monsanto, and this applies anywhere in the world. Monsanto reserves the right to claim royalties for such work. Even more disturbingly, information on the database that is

duplicated in any public source, and gained from that source, is also subject to those conditions. Unrestricted publication of research gained from using Monsanto's database is limited to 250 kilobases [4].

That is only half the story so far. Monsanto has become renowned for throwing its weight about in the farming community. Several hundred lawsuits are pending following the successful prosecution of Canadian farmer Percy Schmeiser for alleged illegal possession of Monsanto's Round Up Ready canola. Schmeiser has now launched an appeal citing seventeen instances of the judge having erred or judged contrary to law. Amongst these are the determination that a farmer who inadvertently grows Roundup Canola has no right to grow or sell any such seeds or plants regardless of how they came to be there. Another crucial ground for appeal is that Justice McKay placed the onus on Schmeiser to prove how the seeds came to be in his field whether by contamination or otherwise [5]. Monsanto subsequently set up a "snitch" line, advertised on radio stations in western Canada, to encourage reports on other alleged 'malpractices'. Following protests, this has been dropped [6].

Now Monsanto is suing another Saskatchewan farmer for allegedly growing Round Up canola without a license. Kelly Ryczek is accused of obtaining Round Up seeds from a source other than Monsanto. Ryczek allegedly planted some of these seeds and sold others on. Monsanto is insisting Ryczek surrenders the seeds, and is demanding a penalty for breach of their patent rights [7].

The Schmeiser case, because it took place in Canada, has prompted concerns that it will serve as a legal precedent in other commonwealth nations. Professor Brad Sherman of the Centre for Intellectual Property in Agriculture, Australia National University, has pointed out that Schmeiser was prosecuted for infringement of exclusive rights awarded to Monsanto. Monsanto won the case based solely on the fact its GM canola was found growing on Schmeiser's land, regardless of the fact Schmeiser was a victim of contamination.

Sherman thinks farmers are being pressured into buying Monsanto seeds, because, if not, they run the risk of being prosecuted like Schmeiser. Sherman concludes that the patent holder "has no incentive to take responsibility for controlling its technology". On the contrary the farmers are being made responsible for controlling the patented genes [8].

It gets worse. The selling point behind Roundup Ready is that it is a glyphosphate-resistant strain. Spray on the herbicide and you're left with nothing but Monsanto crops. However, after two years application, glyphosphate-resistant volunteer corn plants begin to flourish. This has led to the most bizarre Monsanto patent yet awarded. US patent # 6,239,072 covers the practice of mixing glyphosphate with other herbicides, and any premixture thereof. This patent has been awarded despite the fact that mixing herbicides is what any sensible, thinking farmer would naturally do, and has been doing, in the event of resistant plants emerging. The patent also serves as a "de facto" admission of the GM "superweed" problem and that Roundup technology lacks efficacy and predictability.

It doesn't end there. The scope of Monsanto's 'invention' extends to using the mixtures on any straggler volunteer crops that may develop glyphosphate resistance by accident or design, at any time in the future. Using such broad patents, Monsanto assures that nothing escapes its clutches. By forcing farmers to use faulty technology and then patenting further methods to rectify those faults Monsanto is placing the farming community in a quicksand of ongoing legal obligations [9].

Fortunately, Monsanto doesn't always get its way. Monsanto was subject to a US department of Justice Antitrust Division enquiry back in 1998 regarding their acquisition of DeKalb Genetics Corporation. Similarly, when Monsanto attempted to acquire Delta & Pine Land Co in 1999 to gain control of that company's terminator seed technology, the Antitrust Division indicated that it was prepared to sue to prevent the transaction. In a recent speech made before the Organization for Competitive Markets in Nashville, Douglas Ross, Special Counsel for Agriculture at the Antitrust division outlined the basis on which prosecution for antitrust regulations can be brought. Amongst others, he cited conspiracies to deny market access or otherwise suppress competition, the use of predatory and/or exclusionary conduct to hold on to a monopoly in the market and mergers that are likely to lessen competition in the market. Monsanto is guilty on all three counts [10].

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9. "Monsanto sees opportunity in glyphosphate resistant volunteer weeds" by David Dechant, Aug 3, 2001 www.cropchoice.com
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Defending Bové Defending Independent Science

Scientists and farmers, North and South, joined hands in a day of action defending democracy and independent science. Dr. Mae-Wan Ho reports on her visit to Montpellier November 22, 2001.

It was one-thirty in the afternoon, and hundreds had gathered outside the Montpellier magistrate's court, carrying placards and flags, their faces glowing with expectation in the chilly November sunshine. José Bove and co-defendant Dominique Soulier arrived to loud cheers and a thicket of cameras. They were accompanied by Prof. Mahata Devaru Narijundaswamy, president of the association of farmers in Karnataka (KRRS), part of the People's Caravan movement highlighting the plight of Third World Farmers, and Dr. Arpad Pusztai, senior UK scientist who lost his job for scientific findings against genetically modified potatoes. The four spoke briefly and emotionally to the crowd before entering the court, joined by other scientists who would take part in defending the farmers. This beautiful historic town is about to witness another historic event - independent science and farmers joining hands against the corporate takeover of science.

Bové, Soulier and a third farmer, René Riesel, had appealed against an earlier judgement that sentenced them to two years imprisonment for destroying GM rice grown in the Montpellier CIRAD (international agronomic research centre for development), a publicly funded nation-wide research institute. The plants were destroyed on 5th June, 1999, in broad daylight and in front of the TV camera. Prof. Narijundaswamy and 50 Indian farmers took part in the action, which he characterised as "non-violent and in the tradition of Ghandi".

But why target a research institute, and GM rice that was growing in the green house? The significance of the act did not dawn on me until after our appearance in court at the end of a gruelling 5 to 6 hour confinement in the witnesses' cubicle, as is the tradition in French court. It was after nine in the evening when the ordeal was over, and we could settle down to dinner in a restaurant.

Bové, chief instigator, is ready to go to jail if necessary. He told me he has been jailed twice before, each time for a month. The first was in resisting the French military from taking over local farms, and the second time, he shot to fame for dismantling a McDonald kiosk as an act against corporate capitalism. "We did it perfectly, and are very proud of it," he said, between puffs on his pipe, "We took it apart with precision, by undoing nuts and bolts, and without damaging it."

Bové cultivates his peasant-farmer image very effectively. The forty-eight year old is chestnut-haired, of medium build, and has a dark moustache just short of bushy. What catches one off-guard is his complete command of every situation as it arises. He can switch instantly between a TV interview and an intimate conversation. His English is adequate, but he communicates far more than the words convey.

Is he a closet intellectual? I wondered, sitting across the table from the man, flanked by his wife for the past two years on one side and his lawyer on the other. His supporters from the Confederation Paysanne were scattered around the restaurant, guzzling the local Bordeaux, and occasionally shouting affectionate remarks in Bové's direction. Out in the streets, even the gendarmes greeted him and shook his hand. Inside the court, the guards, like everyone else, clung onto his every word, and every word that the witnesses said in his defence.

"They think I don't know anything about science. They are so stupid! I know all about science!" he exclaimed, in the manner of someone who knows far too much. "My parents are scientists. My mother worked in the CIRAD for 42 years. She was in court today. She supports

what I am doing, and knows what they are up to in CIRAD.” What about his father? “He works on plant viruses, and he has been evaluating CIRAD’s programme around the country.” “Does he support you too?” I asked. “Yes, though not as much as my mother.” Neither parent has gone public with their dissatisfaction with what is happening within the scientific establishment. But there is clearly a deep unease about science and scientific research both within the scientific community and in society at large.

Bové said they destroyed the GM rice to protest against the way publicly funded research is acting to the detriment of the people it was supposed to help. The CIRAD is supposed to do research that helps Third World development, but GM rice is overwhelmingly rejected by the poor farmers all over the world. Not the least among their objections being that GM crops are subject to corporate patents. By involving Indian farmers, they were also demonstrating North-South solidarity among the farmers and demanding scientific research that benefit them both.

Syngenta had announced the sequence of the rice genome earlier this year, and the company is busy patenting genes, adding to the hundreds already patented. The ‘golden rice’ engineered to produce Vitamin A is widely recognised to be a fraud designed to salvage a morally and scientifically bankrupt industry [1]. GM rice is now forced onto Indian farmers, according to Narijundaswamy, after suspected GM cotton and other GM seeds were sold to them, resulting in massive crop failures and suicides. It is estimated that some 10 000 farmers had committed suicide within the past three years [2]. He had demanded to be arrested with the French farmers, but was ignored, and so he came to state his case again. He was here to fight the “bad science” that destroyed lives and livelihood, he said.

The greatest surprise was the line-up of scientists from France. Where else in the world would top scientists sitting on government committees on genetic modification act as ‘moral witness’ for those convicted of destroying GM field trials? One of them is on the very advisory body that gave approval for the GM rice destroyed.

Jacques Testart is the director of research at INSERM, the national institute of health and medical research, and President of the French commission on sustainable development. His main message to the presiding magistrates, all three of them, was that there had been no proven benefit of GM in either medicine or agriculture. He should know, because he started in reproductive biology and got involved in cloning and GM research, but gave that up. “Talk of balancing risk versus benefit is ridiculous”, he said, “when benefit equals zero”. Carrying out open field trials when research under contained conditions is incomplete is simply putting cart before the horse. He said that varieties with 3 times the level of vitamin A in ‘golden rice’ already exist, and were created by traditional breeding. It is clear that GM rice research is profit-oriented, and not for public good.

Gilles Eric Seralini is on the French government’s commission of molecular genetics, one of the two expert advisory groups that gave approval for the open field trial intended for the GM rice that was destroyed by Bové and friends. Seralini explained that there were 18 members in the group, only ten of them were present when the approval was given. He had left the group by that time, because the ten decided that as they formed the majority, they could give approval even when the others did not agree. The application for open field trial from CIRAD was heavily criticised. “There were no studies on risks, the stability of the plants intended for open field trials was not documented, and it was the intention to use the open trial itself to select for stable lines.” Seralini recalled, “That was why I left.” The risks of the Bt-pesticide engineered into the plant were unknown. There were also two antibiotic resistance genes present that could spread to pathogens. “The experiment had commercial interests at heart, and not basic scientific interest. It was perverting the mandate of the institute to carry out independent research for public good.”

In the tradition of French melodrama, the two scientists for defence were exactly opposed by two acting for the prosecution. Both prosecuting witnesses were senior agricultural scientists, one sitting on the same government advisory body as Seralini, and the other, on a committee of “four wise men”, responsible for organising GM debate nationally, that includes Testart. This gave rise to hours of lively, at times unbearably loud, but nevertheless good-natured debate in the small witness cubicle before we were led, one after another, to the court. The courtroom scene must have been extremely entertaining, and the small courtroom was filled to capacity.

As if that were not enough, on that very morning, a group of some 20 scientists from the French Academy of Sciences (equivalent to the UK Royal Society and the US National Academy of Sciences) issued a press release condemning the defendants for ‘obstructing the course of science’. And as the courtroom drama unfolded, a parallel public meeting was held outside, on the social responsibility of science and scientists.

So the science war is definitely on in France, and for all to witness. Pusztai and I were both amazed. Such openness is unheard of in the UK, where no government scientists would dream of

criticising GM in public, let alone defend GM 'activists'. In fact, publicly funded scientists are bound by contract not to get involved in politics, though in practice, they will never get reprimanded for singing the praises of GM [3].

Pusztai simply told his personal story in court. "I was a believer in GM", he said, "I did not do the experiments in order to destroy GM". But when his results told him there were both long term and short-term damages to the rats fed on the GM potatoes, and furthermore, it might be the genetic modification that was the problem, he felt obliged to tell the public. Now, three years later, none of his critics have repeated his research. "There is still only a handful of published studies on assessing safety of GM foods, most of them done by me". "I am not about to give up", he stated emphatically when challenged by the prosecuting lawyers who read out the notorious Royal Society Report put together with unseemly haste in an attempt to discredit him. "I will see to it that further research is done!" Many came to thank Pusztai for his testimony afterwards. It was gratifying to see time and public appreciation healing this deeply wounded man to whom Prince Charles had said, "the nation owes you an apology". He has found peace in having chosen to obey "a higher law" than the one that makes scientists conform to the corporate culture.

"I am here to defend independent science and scientists", I told the court [4]. The unpalatable truth that Pusztai's experiments suggested was that GM was inherently hazardous. One of the most serious hazards of GM was highlighted in a report early this year. Australian genetic engineers accidentally transformed a harmless mousepox virus into a pathogen that killed 100% of its victims. Since the anthrax attacks began in the United States, Bush has called for tightening control on both biological weapons and genetic engineering. "The same methods and many of the same materials used in bioweapons are used in making GM crops", I said. "But while bioweapons are made under strictly contained conditions, GM crops and other products are released into the environment as if they were safe. Nature becomes a huge uncontrolled experiment for generating superviruses and superbugs." When scientific evidence is being wilfully ignored and dismissed, we can only thank those who risk arrest and imprisonment to put the message to our governments.

The verdict will not be known for at least another month. But I am told that since the trashing of the GM rice, no other field trials have been approved in France.

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Citizen's Vigil Exposes Bad Science in GM Crop Trial

Local inhabitants of the Scottish Highlands witnessed another GM crop fail in front of their very eyes. Scientists who have approved the UK farm-scale field trials should be held to account. Dr. Mae-Wan Ho reports.

The temperature has dipped below zero for short spells since the beginning of November when the first snow arrived. It snowed again days before Christmas and also turned very cold. The children were taking advantage of a sunny break to decorate a Christmas tree by the freezing pond, their laughter bright and sparkling as fresh ice.

The Munloch GM Vigil (munlochylvigil@tiscali.co.uk) had started up spontaneously in August after a local march and rally in protest of the GM crop trials approved by the Scottish Executive. That was despite repeated veto by the local inhabitants and their elected representative, the Highlands Council (see "Beware corporate takeover of organics" *ISIS News* 11/12 www.i-sis.org).

Some local people went to see Jamie Grants Roskill Farm near Munloch on Black Isle, where Aventis' GM oilseed rape was to be planted. While they were there, a tractor appeared without warning, and started sowing the seeds, at which point, a dozen of the locals walked on to the field and sat down in front of the tractor, putting a stop to the sowing. The next day, many more people gathered at the field, and again, some put themselves in the tractor's path. This time, eleven were arrested, ten of whom have been charged with aggravated trespass and are awaiting trial.

Since then, a constant vigil had been kept near the field. An encampment has grown up at the site. The decisive act must have been the “raising of the yurt” towards the end of September, and which now forms the central feature of the camp. The original yurt, as explained to me, is a round Tibetan house with a wooden frame, covered with fur. The Munlochy version consists of a hemispheric plywood frame set on top of a cylindrical trellised wall, one and one-half metres tall, enclosing a space about four metres in diameter. The whole is draped with bright blue-green canvas. An opening at the top lets through the chimney connected below to a stove for cooking and to provide heating against the cold nights.

From the camp, a campaign has grown up to “stop the crop”. More than 3000 signatures have been collected. Jamie Grant has tried to get them off the site, but the Highlands Council decided they had a right to be there in peaceful protest.

Chain-saw operator Anthony Jackson, thirty-ish with long-blond hair worn loose, and Nigel Mullan, 46, visual artist and sculptor, are two of the main ‘vigilantes’.

“There’s a minimum of two or three of us constantly at the vigil. Then there are 30 to 40 regulars, the same number of supporters, and hundreds of friends and donors.” Anthony said.

Across the road from the camp is the closely watched GM oilseed rape field trial. And nothing has escaped notice.

At the beginning of October, the field was sprayed with the herbicide glufosinate ammonium, as the GM oilseed rape is engineered to be tolerant to the herbicide, and it has also been treated with a fungicide. “It has rained quite heavily since the sprays and the runoff is directly into the Munlochy Bay. But the scientists have avoided sampling the water in the Bay.” Nigel said. There is plenty of evidence that glufosinate is poisonous to a wide range of wild-life, and causes birth defects, which is why the herbicide is not approved for commercial use.

But it soon became clear that all was not well with the GM crop either. It was severely stunted compared with the control and commercial crops planted side by side. The GM crop was a quarter to a fifth the height of the control and commercial crops, and was noticeably more sparse and had more weeds growing in it.

“The control crop has substantial leafage and a closed canopy, thus restricting the amount of light available for weeds to grow,” explained Anthony and Nigel. There was much more variation among the plants in the GM crop. Many of the leaves had turned yellow or had yellow edges. And one of the plants in the GM field had started to flower, “probably four months early”.

In other words, the crop was showing typical signs of genetic instability that has plagued many other GM crops (see “Scrambled genome of RR soya” and other articles, ISIS News 9/10 www.i-sis.org). This alone would invalidate any findings from the field trials, making the entire exercise pointless, particularly in the light of the new European Directive governing deliberate release of GM crops (see below).

The GM oilseed rape fiasco was reported in the local Highland News at the beginning of December. Aventis’ response was that although the varieties used are “very similar”, the GM crop was of a “different” variety from the control, a fine example of Orwellian ‘doublespeak’.

And no wonder, this particular GM oilseed rape was approved as “substantially equivalent” (to non GM oilseed rape) by the Scientific Committee on Plants in Europe. But that was before the European Directive for deliberate release has been substantially strengthened last year (see “Europe’s new rules could sink all GMOs” ISIS News 11/12 www.i-sis.org). This change of reference makes the farm-scale field trials obsolete, because they are unlikely to pass muster for commercial approval at the end.

According to the report by the Agriculture and Environment Biotechnology Commission, the object of the farm-scale field trials is not to find out if the GM crops are safe. Yield is also not relevant measure, even though some farmer experiencing such a drastic crop failure might well commit suicide. Both those aspects have already been “approved by the regulatory authorities”. The farm-scale field trials are not designed to answer all key questions about GM crops. Only “some key indicators of biodiversity” will be monitored to see if there are differences between the two halves of each field.

“This obviously makes a complete mockery of the science involved.” Anthony and Nigel rightly conclude. The scientists who have approved such crops should be held to proper account.

To see some of the excellent pictorial evidence provided by Munlochy GM Vigil, visit ISIS website www.i-sis.org

Mice Prefer Non GM

A Dutch farmer left two piles of maize in a barn infested with mice, one pile GM, the other non GM. The GM pile was left untouched, while the non GM pile was completely eaten up. Incredible! Young

undergraduate Hinze Hogendoorn devised his own laboratory test and confirmed the finding, and more. Dr. Mae-Wan Ho reports from her recent visit to Hilversum near Amsterdam, where he lives with his mum.

Mum Guusje is very proud of her son, though she waited until he took the train back to University College, Utrecht, to tell me about it. A young activists group (Jongeren Milieu Aktief) presented the report Hinze has written to the Dutch parliament on 11 December, and is featuring it on their new website (www.talk2000.nl).

Hinze couldn't find a single scientific report on animals being tested for preference of GM versus non GM food on the web when he began. On extending his search to effects of GM foods on animals, he came across reports from companies developing GM foods, unanimously declaring there were no adverse impacts. But he also came across independent researchers who have reported harmful effects, including Dr. Arpad Pusztai, who found GM potatoes damaged the kidney, thymus, spleen and gut of young rats. Hinze was disturbed, not just by the scientific findings, but by the fact that scientists opposing the big companies are so easily discredited. "Personally, I'm afraid these companies have too much interest invested in their products for their research to be creditable." That was another motivation for him to do his own experiments.

The 17 year-old was stumped at first, because he would have needed to go through a lot of bureaucracy to experiment on animals. However, he managed to rescue 30 female six-week old mice bred to feed snakes from a herpetology centre. The next problem was to find the appropriate food. He went to a website on the care of mice. Mice eat about 15% of their body weight every day, and they need a diverse diet. So he decided to give them a staple food along with the two foods that were to be compared, so they could really show their preference without being starved. For the staple, he used Rodent mix from the pet store, as well as some oatmeal and cereals guaranteed by their producers (Kellogg's and Quaker's) to be 'GM-free' in the Netherlands. For GM foods, he used maize and soya, and the corresponding organically grown versions as non GM. Water was supplied for the mice to drink as they pleased. And he kept track of all the food consumed each day.

Large cages were used so the mice had plenty of room to move around. At the beginning, all the mice were weighed before they were put into the cage with four bowls containing GM and non GM maize meal, and GM and non GM soya meal respectively. The mice had not eaten for some time, but amazingly, they already showed very definite food preferences. The didn't like soya meal at all, GM or non GM, and only one mouse was found feeding on non GM soya meal for one minute in the 10 minutes they were observed. In the same period, 4 to 8 mice could be found in the bowl with non GM maize, compared to 1 to 3 in the bowl with GM maize.

For the next week, Hinze continued to give the mice GM and non GM maize or soya chunks (which they did eat) in addition to their staple food, and measured the amount of each consumed daily over the next week. In all nine successive observations, more non GM was eaten than GM for maize or soya. In sum, the mice consumed 61% non GM and 39% GM food when given free choice. The results were highly significant, even though Hinze did not perform the statistical test.

For the next experiment, Hinze tested for the effects of GM food. By this time, however, one mouse had died for unknown reasons. So he removed another mouse from the experiment, assigned 14 to the group fed GM food and 14 to the group fed non GM food after weighing them. Over the next 10 days, he kept track of the amount of food that the two groups consumed each day, and weighed the mice, halfway through and at the end of the experiments.

The group fed GM ate more, probably because they were slightly heavier on average to begin with, but they gained less weight. By the end, they actually lost weight. In contrast, the group fed non GM ate less and gained more weight, continuing to gain weight until the end of the experiment. The results were statistically significant.

That was not the only difference observed. There were marked behavioural differences, though Hinze admitted, these were "subjective" and not quantitative. The mice fed GM food "seemed less active while in their cages". The differences in activity between the two cages grew as the experiment progressed, the mice in the non-GM cage were in the exercise wheel more often than those in the GM cage. Hinze also noticed that each time he came into the room, there tended to be more mice in the non GM cage walking or climbing around than in the GM cage.

The most striking difference was when the mice were weighed at the end of the experiment. The mice fed GM food were "more distressed" than the other mice. "Many were running round and round the basket, scrabbling desperately in the sawdust, and even frantically jumping up the sides, something I'd never seen before." They were clearly more nervous than the

mice from the other cage. "For me this was the most disconcerting evidence that GM food is not quite normal."

Another "interesting result" is that one of the mice in the GM cage was found dead at the end of the experiment.

He concluded, "At the end of everything, I must admit that the experiment has done nothing to soothe my qualms concerning genetically enhanced food." His results "do seem to agree with Pusztai's".

Hinze is tall and athletic, and definitely doesn't like GM food. He is pleased to have found all that out for himself, and suggests everyone should do the same.

He has put the scientists to shame, especially those who have condemned Pusztai's work, but have done nothing since to add to our knowledge.